POST HARVEST DISEASES OF CUCURBITS

The Gourd Family (*Cucurbitaceae*) Including **squash, pumpkin, cucumber, gourd, watermelon, and cantaloupe**.

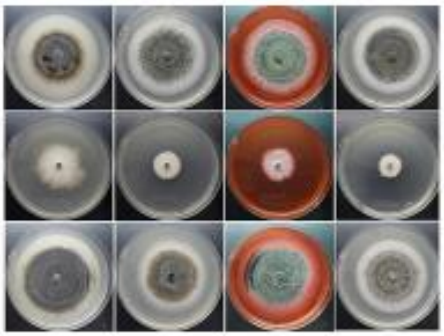
Anthracnose

pathogen: *Colletotrichum orbiculare* (C. lagenarium)

Is a **serious disease of cucurbit crops in warm, rainy summers.** This pathogen can attack all cucurbits, but the most severe disease is on cucumbers, muskmelons and watermelons.

Fungus

- Mycelium - septate, hyaline when young and dark when old
- Setae - brown, thick walled, 2-3 septate
- Conidia - hyaline, oblong and single celled



Setae and conidia of Colletotrichum, as viewed under the microscope

Symptoms

Lesions can form on seedlings, leaves, petioles, stems, and fruits.

infect all above ground plant parts.
Symptoms vary depending on which cucurbit it infects.

- Irregular brown leaf spots.
- The center of the leaf spot may drop out (most common on cucumbers).
- Cucumber leaf spots often have a yellow halo.
- Fruit infections are sunken black spots that may have fluffy white cotton like mycelia and sticky salmon-colored spores during wet weather.

Mode of spread and survival

- Soil and seed borne
- Fungus overwinters in old cucurbit vines or in weeds for 5 yrs
- Anthracnose can appear anytime during the season, but most damage occurs late in the season after the fruit is set
- Spread - running water, workers and the insect *Pimelia sp*.

Epidemiology

- Warm, wet conditions - favour rapid development and spread of the disease
- Temp - 25°c, 100%RH

Management

- Field sanitation - destroy the plant debris
- Hot water treatment of seeds 57.2°c for 20 min
- Seed treatment - thiram or carbendazim or mancozeb 2g/kg
- Spraying at weekly intervals of
  - Carbendazim 0.1 %
  - Mancozeb 0.2%
  - Difolaton 0.2%
- Fruit dip - 5 min in wash water containing 120 ppm of chlorine helps to prevent infection of healthy fruits
- Resistant varieties in watermelon
- Some resistant varieties of cucumber are available.
- Rotate vegetables so three years go by before planting any member of the squash family in the same location.

Phytophthora Crown & Fruit Rot (*Phytophthora capsici)*

All cucurbits are susceptible; pumpkin and squash seem to be the most commonly affected.

Phytophthora fruit rot was first reported in the United States in Colorado and California in the late 1930s.

The fungus infects all above-ground parts of cucurbits. In addition to fruit rot and crown rot, these fungi cause seedling damping-off, root rot, stem lesions, foliar blight and leaf spots.

Symptom :

Water-soaked lesions on fruits, which is covered with white fungal-like growth

Fruit rot of yellow summer squash

Fruit rot of zucchini

Phytophthora blight on watermelon

- Fruit rot of processing pumpkin caused by *P. capsici*:
- Lesions appear on fruit surface;
- Fruit rot developed on the side contacting the soil;
- Fruit rot as a result of falling an infected leaf on fruit
- Severely infected fruits are collapsed.

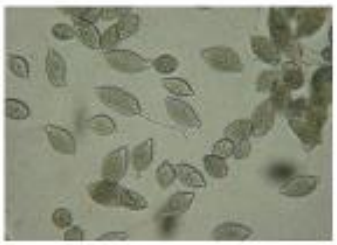
First indication of sporulation on the earlier water-soaked lesion

The fungus produces a white, yeastlike growth that contains many sporangia, especially under moist conditions

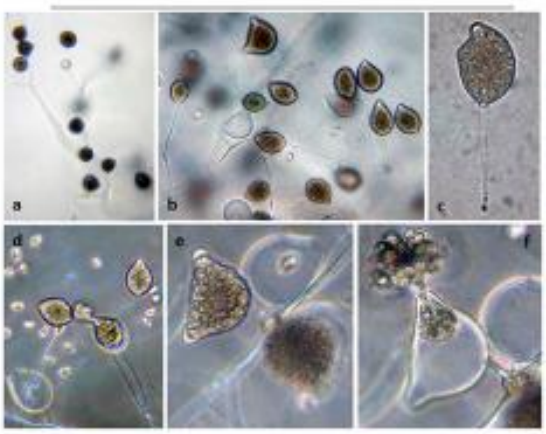
Total collapse of pumpkin crop

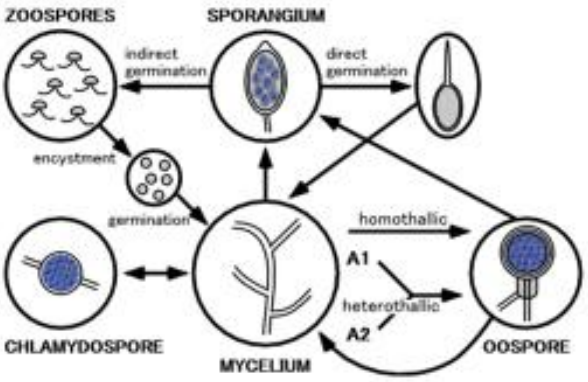
Various stages of fruit rot of watermelon caused by Phytophthora

Survival:
The fungus survives in soil as oospores, which are believed to be the primary overwintering propagule, or as chlamydospores between crops for at least 2 years



Spread:
Movement in soil on equipment is probably an important means by which *Phytophthora* has been spread between fields and may account for disease occurrence in fields with no history of susceptible crops.





Management

- Rotation with non-host crops is recommended.
- Other hosts are pepper, tomato, eggplant, cocoa, and macadamia.
- Manage soil moisture by selecting well-drained fields, avoiding low-lying areas, subsoiling, preparing dome-shaped raised beds for non-vining crops, and not over irrigating.
- Movement in soil on equipment is probably an important means by which *Phytophthora* has been spread between fields and may account for disease occurrence in fields with no history of susceptible crops.

Fruit rot *Rhizoctonia* Belly rot of Cucurbit
Fungus: *Rhizoctonia solani*

mainly affects cucumber; it is rarely found on other cucurbits.
a common reason behind **rotting fruits on cucumbers**
Ripe fruits are most susceptible to the disease

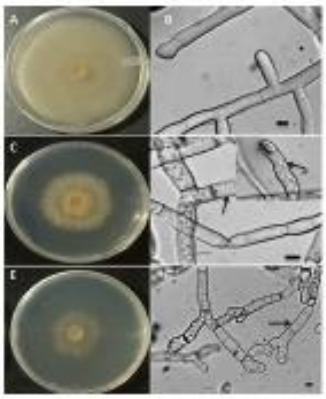
Symptoms:

- Dark brown water-soaked decay on the side of the fruit in contact with the soil
- Followed by a yellowish-brown discolouration of the fruit surface
- Entire fruit rot within few days

Water-soaked lesions

Fungus

- Produces pycnidia and sclerotia
- Pycnidiospores - hyaline, single celled, ovate to ellipsoid



Environmental conditions:

Rhizoctonia fruit rot prefers moderately wet soil paired with heat.

Mode of spread and survival

- *R. solani* overwinters in soils as mycelia on plant debris and as dark brown sclerotia that remain in soil for long periodsand in nearby weeds.
- spreads through contact with infected soil, splashing water or tools.

Management

Pre-harvest sprays of the fungicides
Azoxystrobin
Chlorothalonil
Thiophanate-methyl

Always allow at least three years between planting the same or related plants in an area affected by this disease.

Holding the fruit at 10°C will retard disease development during transit and storage

Fruit rot
Pythium aphanidermatum

Symptoms

- Fruits in intimate contact with soil is affected
- Forms a luxuriant wooly mycelial mat on the affected fruits
- Skin of the friut shows soft, dark green, water soaked lesions
- Interior tissue become watery and soft and decaying matter emits a bad odour

Aboveground symptoms consist of plant stunting, wilt, and death

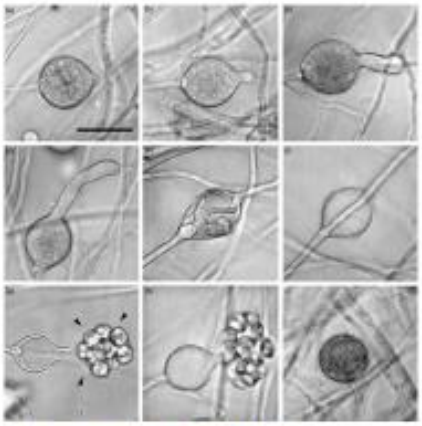
Pythium species are soilborne. It can survive indefinitely on organic substrates or as thick-walled oospores.

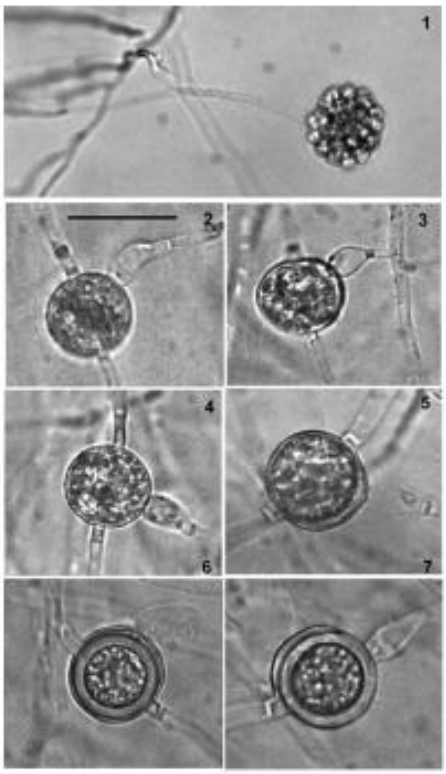
Fruit infection occurs via vegetative mycelium, sporangia, zoospores, or oospores.

Pythium Root and Stem Rot

Fungus

- Mycelium
- Oogonia
- Antheridia
- Oospore
- Zoospore





- Spreads among the fruits during the storage and transit
- High moisture and temperature favours the growth

Sporangia and hyphal swelling

Management

- Source disease-free seeds.
- Avoid excessive watering and low, poorly drained areas of the fields.
- Prevent fruit contact with the soil.
- Fungicide.
- Soil drenching with copperoxychloride - 0.25%

Cucurbit Scab
Pathogen: *Cladosporium cucumerinum.*

Choanophora rot
Pathogen: *Choanephora cucurbitarum*

T. A.