

# Pacific Pests, Pathogens and Weeds - Online edition

## Capsicum (chilli) anthracnose (177)

### Common Name

Capsicum anthracnose

### Scientific Name

*Colletotrichum* species, most often *Colletotrichum acutatum*, *Colletotrichum capsici* (possibly the same as *Colletotrichum dematium*) and *Colletotrichum gloeosporioides* (the sexual state is *Glomerella cingulata*).

### Distribution

The fungi are likely to be present in all Pacific island countries where capsicum and chillies are grown; they are common fungi. *Colletotrichum gloeosporioides* occurs in American Samoa, Australia, Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, New Caledonia, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu (and more); *Colletotrichum capsici* in Cook Islands, Fiji, Niue, Papua New Guinea, Samoa, Solomon Islands, and Tonga; *Colletotrichum acutatum* in Fiji and Samoa.

### Hosts

Capsicum and chilli, and other kinds of vegetables (e.g., tomato), root crops (e.g. yam), and fruit trees (e.g., papaya, mango).

### Symptoms & Life Cycle

On the fruits of chilli and capsicum, the first sign of the disease are small, slightly sunken, dark yellow spots on the fruit surface. The spots darken, enlarge and merge during wet weather or when humidity is high (Photos 1&2). Often, there are multiple infections on the one fruit (Photos 3&4). Pink spore masses of fungal spores form on the spots, arranged in rings (Photos 5-7) and, later, these turn black as dark hairs develop (Photo 6).

Post-harvest rots are also common (e.g., avocado, eggplant and mango) (Photos 8-11).

On the leaves, irregularly shaped brown spots with dark borders. These spots are similar to frog-eye spot (**see Fact Sheet no. 92**). However, symptoms on leaves are often rare, even in fields with severe fruit infection.

Infection can occur at any stage of fruit development, but symptoms usually appear on the fruit when they are about to ripen. There are, however, more aggressive species, such as *Colletotrichum acutatum*, that cause symptoms at any stage of fruit development. Warm wet weather, with temperatures around 27°C, and humidity above 80%, are ideal for disease development. Leaf wetness is a particularly important factor.

Spread of the fungi over short distances is by spores in wind-driven rain. Fruit can also become infected from the fungi living on debris in the soil. Survival occurs in crop debris and on or in capsicum seed. It is likely that survival also occurs on weeds and other crops species; these fungi have a wide host range.

### Impact

Anthrachnose of capsicum and chillies can be a serious problem in tropical and subtropical regions. The damage caused by anthracnose is especially serious in many Asian countries including South Korea, Taiwan, Indonesia and Thailand, reducing marketable yields by 10-80%. In these countries, *Colletotrichum acutatum* is the most destructive of the several anthracnose pathogens present.

The fungi causing anthracnose can be on or in the seed, and this can lead to pre- and post-emergence damping off.

### Detection & inspection

Look for spots on the fruit, first yellowish, rapidly growing, merging, turning pink as the spores develop and later black with concentric rings. Look for irregularly shaped brown spots on the leaves with dark brown borders.



Photo 1. Large spots on capsicum caused by *Colletotrichum* species. Note the rings inside the spot giving it a 'target-like' appearance. The tiny whitish dots in the spot are the spore masses of the fungus.



Photo 2. Large lesion of anthracnose, *Colletotrichum* species distorting shape of fruit.



Photo 3. Multiple spots on capsicum caused by *Colletotrichum* species, typical of infection by this fungus.



Photo 4. Dark, merging spots on the surface of chillies caused by *Colletotrichum* sp. The fruit in the foreground (left) has completely shriveled due to infection.

## Management

### CULTURAL CONTROL

Before planting:

- Use disease-free seed. Seed should be treated at 52°C for 30 minutes. But do not guess; use a thermometer and accurately time the treatment.
- Check each seedling for freedom from leaf spots before taking the seedlings from the nursery to the field.

During growth:

- Avoid overhead irrigation as water splash spreads these fungi, or if overhead irrigation is used, apply early in the day so that the plants are dry before evening.
- Control weeds and volunteer capsicum and chilli plants.

After harvest:

- Do not plant capsicum in the same land if the last crop was diseased; leave a gap of 3 years and during the period of rotation avoid crops in the capsicum family, for instance, tomato or eggplant.
- Plough in or remove crop residues in infected fields.

### RESISTANT VARIETIES

AVRDC, The World Vegetable Center, and other research institutions have been breeding chilli peppers for resistance to anthracnose. However, the resistant lines need to be evaluated on site to confirm their performance against the species (and strains) present at different locations.

### CHEMICAL CONTROL

If a fungicide is needed, use mancozeb or a copper product. Apply protective sprays beginning at flowering.

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*When using a pesticide, always wear protective clothing and follow the instructions on the product label, such as dosage, timing of application, and pre-harvest interval. Recommendations will vary with the crop and system of cultivation. Expert advice on the most appropriate pesticides to use should always be sought from local agricultural authorities.*



Photo 5. Multiple infections of *Colletotrichum* species. on a chilli fruit.



Photo 6. Sunken spots on chillies caused by *Colletotrichum* sp. Note that on the fruit, second from left, the spot has turned black as the dark hairs of the fungus develop



Photo 7. Multiple infections of anthracnose, *Colletotrichum* species, showing light pink areas on the spots where spore masses have developed.



Photo 8. Spores masses of *Colletotrichum acutatum* on avocado.



Photo 9. *Colletotrichum capsici* rot on eggplant.



Photo 10. Large *Colletotrichum capsici* rot on eggplant showing fruiting bodies in concentric rings.



Photo 11. Dark spots, many enlarging and joining together, of mango anthracnose, *Glomerella cingulata*. The fungus infects the skins and later develops in storage. Orange-pink spore masses develop in the centres of these areas (**see Fact Sheet no. 09**).

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Information from *Diseases of fruit crops in Australia* (2009). Editors, Tony Cooke, et al. CSIRO Publishing; and from Eric McKenzie (2013) *Colletotrichum acutatum* (Photo 8), *Colletotrichum capsici* (Photos 9&10) and *Colletotrichum gloeosporioides* (Photo 11); PaDIL - (<http://www.padil.gov.au>). Photos 1&2 Mani Mua, SPC, Sigatoka Research Station, Fiji. Photos 3-5 AVRDC, The World Vegetable Centre. Photos 6 Than PP, et al. (2008) Chilli anthracnose disease caused by *Colletotrichum* species. *J Zhejiang Univ Sci B*. 9(10): 764B778. Photo 8 *Colletotrichum acutatum*, Photos 9&10 *Colletotrichum capsici*.

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