Postharvest diseases and disorders of strawberries



This fact sheet provides information on a range of postharvest diseases and disorders that occur in strawberry production. As there are currently no postharvest fungicides available for strawberries, management involves a range of tasks that are to be undertaken throughout the production cycle. It's important to note that pre-harvest factors like plant spacing, weed pressure, air flow between plants, correct application of fungicides, and postharvest factors like handling and storage, all have the ability to contribute to a disease incursion. The correct management of these factors can significantly reduce the likelihood of infestation, and result in a profitable harvest.

For information about how to manage strawberries during and after harvest please refer to the chapter on postharvest handling of strawberries in the Good Practice Guide.

Grey Mould

The most common decay is grey mould, caused by *Botrytis cinerea*. This disease may be present in the field and symptoms not apparent until later, or it may begin postharvest. The fungus will grow at 0°C, but slowly.

Symptoms may occur on blossoms or on fruit at any stage.



Figure 1. Botrytis developing on a strawberry in the field

Temperatures between 18-25°C favour the disease and >85% humidity is required for infection. *Botrytis* is generally not a problem for strawberries grown under high tunnels where the foliage and fruit remain dry. Under low cloches the disease will be more prevalent on the edge rows which are often subject to drips when covers are raised and lowered.

The disease is characterized by grey fluffy mycelium on the fruit surface (see Figures 1 and 2). There is no leakage with botrytis infection. Lesions have no distinct border and the disease will progress until it involves the whole fruit and they may become mummified.





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Figure 2. Botrytis on strawberries postharvest

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Rhizopus soft rot

Rhizopus rot or 'leak', caused by the fungus *Rhizopus stolonifer*, is a common postharvest disease of strawberries usually associated with handling damage. First signs of infection may be leakage of juice from packed fruit, and on inspection a white mould with black fruiting bodies is often seen.

Although Rhizopus rot is generally a problem after harvest, it can also occur in the field.

Rhizopus is usually a disease of over-ripe fruit, which are easily damaged and become invaded by the fungus in warm moist conditions. Infected fruit collapse and rapidly lose juice that leaks from the fruit in the field or container.



Figure 3. Affected fruit quickly collapse and become covered with black spore masses

When picking fruit, be sure to remove the whole fruit from the stem and not leave behind the fleshy receptacle of the fruit which can serve as a site for invasion by the fungus. Rhizopus is a good saprophyte, living on dead tissue, so field hygiene is also extremely important. All ripe fruit, plant material and waste berries should be removed and discarded. Spores are airborne and carried by insects.

To control soft rot, handle fruit carefully to avoid bruising, cool rapidly and maintain the cool chain during transport and distribution. Spore germination cannot occur below 6°C.

Leather rot

Leather rot, caused by the fungus *Phytophthora cactorum*, is usually of minor importance as a postharvest disease. However, the leather rot organism also causes crown rot, a more common disease in the field. Symptoms of the disease on fruit can be quite subtle and it is possible that infected fruit are picked and packed unknowingly. This is an issue as infected fruit have a very bad taste, even a small lesion will result in the whole fruit having an unsavoury taste.



Figure 4. Typical field symptom on immature fruit. Note the black leathery look of the affected fruit.

Fruits may be affected at all stages from blossom to maturity.

Infected areas of immature fruit are dark brown, while infected areas on ripe fruit appear bleached in colour. After harvest, a white fuzzy growth may appear on fruit under humid or moist conditions.

Rainy weather promotes infection by splashing of the fungal spores along with soil particles onto flowers or fruit. Maturing fruit in contact with wet soil may also become infected. Dew may supply adequate moisture for the spores to cause infection.

Control of leather rot is assisted by adequate plant spacing and weed control to promote good air flow and rapid drying of plant surfaces. Plastic mulch covering the raised bed will greatly reduce the incidence of leather rot. In addition, straw mulch should be put between the rows to prevent maturing fruit from becoming contaminated by rain-splashed soil on the surface.

When conditions are very wet, and leather rot is a problem in the field, fungicide sprays may be needed. Effective fungicides for leather rot control include phosphite.

References and further reading

Compendium of strawberry diseases, second edition. Ed. Mass J.L. 1998. USDA, Beltsville, MD, USA.

http://www.calstrawberry.com/en-us/Pest-Management/ Diseases

Images sourced from the Strawberry problem solver and bug identifier developed by the Queensland Department of Primary Industries and Fisheries and Apollo Gomez, research scientist, at the Queensland Department of Primary Industries and Fisheries.

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