

Citrus postharvest diseases: wound pathogens



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Wound pathogens are disease causing agents that do not have the ability to break through the citrus rind, unless in very high numbers. The top three diseases caused by wound pathogens are green mould, blue mould and sour rot. These diseases are the greatest causes of postharvest decay on citrus fruit.

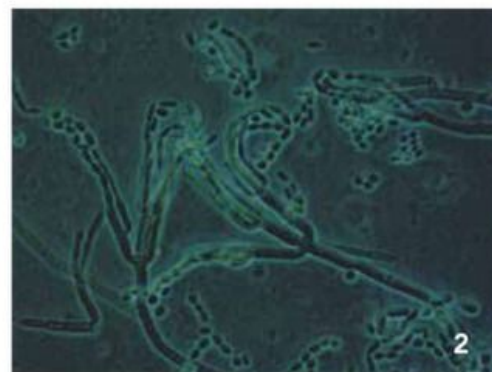
What are green mould and blue mould?

Both green mould and blue mould are caused by fungi in the *Penicillium* genus. *Penicillium* species are very common and you might know the name from the cheese gorgonzola, made with *Penicillium glaucum*, or from the discovery of the antibiotic Penicillin by Alexander Fleming. Citrus packhouses and exporters are much more familiar with the disease-causing fungi of *Penicillium digitatum*, green mould, and *Penicillium italicum*, blue mould.

Of the two, green mould is the biggest problem. It grows much faster than blue mould. You can identify it by the olive-green coloured rot. Blue mould is light blue in colour, grows slower than green mould and is usually found at cooler temperatures. Sometimes green mould is accidentally called blue mould, because in photographs the green spores can look grey-blue. To the experienced eye, one can usually see a difference in the way the fungus grows, even if the colour isn't clear.



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1: Disease progression of green mould.

The white mycelium shows after four to five days, with the olive-green spores following soon after

2: *Penicillium digitatum* spores as seen under a microscope

3: Green mould (left) grows more quickly and has a denser growth than blue mould (right)

What is sour rot?

Sour rot caused by *Galactomyces citri-aurantii*, is our second biggest post-harvest decay pathogen. It gets its name from the sour smell that is given off when the citrus rots. In addition to the smell, sour rot is very soft and you can easily put your finger right through the rotten area. The area is usually slightly sunken and shrivelled and only when very advanced do white spores grow over the area. Sour rot is sometimes tricky to identify from photographs, because other fungi – usually green mould – can grow on top of the sour rot infection.

Stop the Rot!

Green and blue moulds are most commonly controlled by fungicide application, and the active imazalil is currently the most effective. Several alternative fungicides are available on the market for managing resistant populations or dealing with potential future imazalil sensitive markets. Sour rot can also be very effectively controlled by fungicides, but the strongest of these (guazatine) is subject to market restrictions, therefore sanitation and wound prevention practices are key in sour rot management. Wound pathogens need openings or wounds to start rotting, so managing harvesting injuries and ensuring soft handling from picking to packing will stop the disease from developing in the first place. Control of insects that can create wounds such as false codling moth (FCM) and fruit flies are also important. Sanitation, both in the orchard and the packhouse, remains one of the best and most effective tools to stop these pathogens from spreading and will also take care of any fungicide resistant populations that may be developing. ❁

4: Sour rot infection on citrus. The soft, water-soaked lesion is difficult to see if the skin is not broken.

5: Sour rot infections are very soft and over time or if handled, the rind and flesh will collapse

6: *Galactomyces citri-aurantii* spores as seen under a microscope

For more details on the available fungicides, consult CRI's latest factsheets on postharvest recommendations available on www.cri.co.za

