



## Blue mould of pome fruit

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*Blue mould is the most common and important post harvest disease of apples and pears. It is caused by the fungus *Penicillium expansum* and, less often, other *Penicillium* species. The disease is found worldwide wherever these fruits are grown.*

### Symptoms

Blue mould causes a light brown soft rot, which can begin at wounds anywhere on the fruit surface. As the rot progresses, a white fungal growth may appear at skin breaks. Later blue or blue-green tufts of powdery spores appear. Rotted tissue separates easily from healthy tissue, and eventually fruit break down to a watery mass which has a pungent musty odour. Stem ends of otherwise healthy pears may bear a tuft of blue mould which can sometimes progress down the stem and into the flesh. Spread can occur from fruit to fruit, resulting in nests of infection.



*Figure 1. Severe blue mould in Beurre Bosc pears associated with poorly controlled transit temperature.*

### Economic importance

Blue mould is the most important post-harvest disease of pome fruit, despite the use of controlled atmosphere storage and post-harvest fungicides. Losses of around 12% are not uncommon, and where fungicide-resistant strains of blue mould predominate or where other control procedures are inadequate, more serious losses can occur. *Penicillium* species can also be an important cause of core rot in Red Delicious apples.

### Disease cycle

*Penicillium* species that are pathogenic to pome fruit are probably widespread in the orchard environment, but blue mould is mainly a disease that occurs at or after harvest.

Infections usually occur at wounds, and fruit susceptibility increases with maturity. In over-mature or very old fruit, lenticel infections are common and can result in multiple infections or "spot rots". Most infections result from the inoculation of fruit by spores that have concentrated in pre-storage drenches, dips or sprays, or in flume and dump tank water. These become contaminated by spores from rotted fruit, from dirty bins and from soil and other debris from the orchard.



*Figure 2. Blue mould of Packham Triumph pear caused by *Penicillium solitum**

### Control

Post-harvest fungicides are currently available for the control of blue mould. However, isolates of *Penicillium* that are resistant to some of these fungicides are common in many packing sheds, restricting their effectiveness. Furthermore, export markets have varying requirements with respect to maximum residue limits of fungicides, and this may restrict or even prevent the treatment of export fruit. Consequently, increased reliance should be placed on careful harvesting and handling practices, and thorough shed hygiene.

- Careful picking and handling of fruit to avoid injuries to the skin is most important. Rough areas in the grading and packing line, including dust and debris which could abrade fruit, must be eliminated.
- Clean all picking bins pre-season, and avoid soil build-up on their undersides during picking. Do not pick wet fruit, and avoid picking fruit that has fallen to the ground, as this may introduce soil and infected fruit directly into the fruit bin.
- Avoid orchard soil being transferred to handling and storage areas on machinery tyres.
- Minimise the contamination of pre-storage drenches, dips or sprays by washing fruit and bins in fresh or sanitised water before further treatment. Bins can also be decontaminated with moist heat, hot water or steam before harvest.
- Minimise the contamination of flumes and dump tanks by appropriate filtration, water sanitation and regular changes of water.
- Rollers, brushes and belts must not become contaminated with spores or decayed fruit debris, and should be thoroughly cleaned as necessary.
- Washing of fruit in fresh or sanitised water after fruit with rots and other disorders have been sorted out will help to minimise further contamination and infection of fruit.

**For effective pest and disease control, correct diagnosis is essential. A commercial diagnostic service is available at the DPI PIRVic Knoxfield Centre. For further information, contact the Diagnostic Service. ph: (03) 9210-9222 or fax (03) 9887 3166.**

*The previous version of this note was published in December 1999.*

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