

Fusarium dry rot of Potato

Fusarium dry rot of potato is a postharvest disease that causes losses in storage of both seed and commercial potatoes. In the last few seasons, there have been increased reports of dry rots in store this article is a timely reminder on this disease issue which can be proactively managed.

What causes Fusarium dry rot?

Dry rot of potatoes is caused by the fungal pathogen *Fusarium*, of which there are several species. *Fusarium* species that cause dry rot of potatoes are present in many, if not all, soils and can survive for long periods of time. The fungus cannot directly penetrate the healthy tuber and it is entirely dependent on gaining entry through wounds. Wounds caused by mechanical damage during harvest (bruising and cuts), insect damage, scab, or nematode damage.

On cut seed, *Fusarium* cannot infect properly suberised surfaces, therefore conditions to enhance suberisation can reduce the impact of *Fusarium* causing seed piece breakdown.

The same fungi can cause stem end rots of potato tubers.

What is dry rot?

As the common name implies it is a “dry rot” of tubers. Surfaces of infected tubers may be sunken or wrinkled in appearance. Cutting the tuber reveals a distinct brown rotted area. Areas of the rotted tuber may have pink, white or yellow coloured fungal growth. Secondary infection with bacteria may lead to the development of soft rot (which is “wet” and generally has an odour).

How to manage dry rot?

There are 3 key areas that contribute to dry rot management. These areas are mainly focused of preventing disease development.

1. Bruise management
2. Use of fungicides
3. Storage conditions

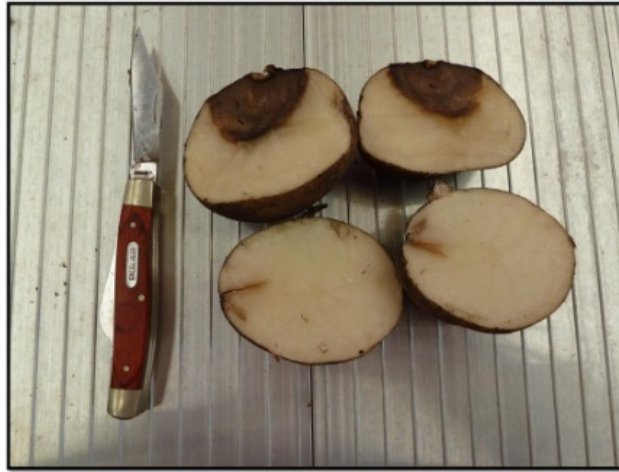
Bruise management

“Reduce the wounds – reduce the disease”

- Handle the tubers as gently as possible during harvest.
- To reduce damage during harvest, pay close attention to chain speeds and do not allow tubers to drop more than 6 inches (approx. 15 cm).
- Use foam padding on surfaces to minimise impact of tubers.
- Do not harvest in very warm, dry conditions (this has been a factor for the last few years)

contributing to increases in dry rots in store).

- Cold tubers (below 10°C) are more prone to damage – avoid harvesting and handling tubers in such conditions.
- Tubers with well-developed skins and those that are harvested without wounding are resistant to dry rot.



Example of shatter bruise promoting dry rot of potato (note the tuber at the top is infected with dry rot)

- Ensuring good conditions at the time of haulm desiccation. Rapid desiccation in dry, hot conditions when crop is under stress can cause stem end defects which may ultimately allow stem end rots to develop. Assess and manage (if possible) soil moisture prior to desiccating crops¹. When using chemical desiccation, always read the label for best results.

Use of fungicides

“Fungicides are available to manage *Fusarium* dry rot of potatoes”

There are several post-harvest fungicides registered for the management of *Fusarium* dry rot of potatoes; the active ingredient of the fungicides includes mancozeb, thiabendazole, fludioxinil and imazalil. Always seek advice from your local agrichemical reseller and always read the label.

There are reports that some species of *Fusarium* that cause dry rot have developed resistance to thiabendazole. It therefore, may be appropriate to rotate the active ingredients used to prevent further resistance development.

Mancozeb is used on cut seed as a management option to reduce the development of *Fusarium* seed piece decay. Both thiabendazole and imazalil are used as fungicide treatments for potatoes into storage. Fludioxinil traditionally was used on seed at planting but new registration allows the option to treat seed into storage.

Ensure fungicides are appropriately applied to give even and uniform coverage of the tuber surface. In doing so, ensure the rate of product and the water rate used is in accordance of the label. Routinely check that your applicator is applying correctly and is calibrated.

Chemical application should not be seen as a substitution for the other management options.

¹ <https://www.syngenta.com.au/news/potatoes/smart-approach-avoiding-vascular-browning-spuds>

Storage conditions

“The right conditions at early storage can reduce the occurrence of Fusarium dry rot.”

Despite all precautions taken during harvest and handling some injury to tubers will occur.

Storage conditions to enhance the suberisation of wounds are necessary to reduce the occurrence of *Fusarium* dry rot. Pathogen infection (and tuber weight loss) is greatest in the first few weeks of storage (i.e. immediately after harvest). It is therefore, critical to enhance suberisation to reduce the opportunity for infection. It is especially important to minimise wounds and encourage wound healing of tubers because *Fusarium* can continue to develop in storage.

Wound healing is best achieved at 10-15°C for one or two weeks. It is important to note that freshly dug potatoes have a high rate of respiration which significantly increases the initial heat load of the stored potatoes. Therefore, the immediate treatment is to reduce the heat load by maximum movement of air through the stored tubers. Positive ventilation (forced air) through the stored tubers is the most effective in removing the heat load. To reduce the potential for condensation occurring on the surface of the tubers (which can lead to increased rots including *Fusarium* and bacterial rots) the ventilation air temperature should be within a few degrees (2 °C) of the pulp tuber temperature. Changes in the temperature should be gradual and stepped down to further reduce the formation of condensation on the tubers.

“Remember, condensation or free moisture on the tuber surface is the ideal condition for the germination of fungal spores and growth fungi such as Fusarium leading to increased risk of rots in storage.”

When dealing with cut seed, positive ventilation of the seed will increase rate of suberisation of cut surfaces and thereby reduce the infection by *Fusarium* that can cause seed piece breakdown.

Finally, the potato store should not be thought of as a hospital; diseased tubers do not get better in store; so ensuring that quality tubers go into store is the best policy to ensure quality tubers come out of store.

For more information contact Dr Nigel Crump AuSPICA on 03 5962 0000 or email nigelcrump@auspica.org.au

The information contained in this fact sheet is for use of AuSPICA members for education purposes only. The information contained is of a general nature only and is believed to be correct at the time of writing. All matters raised in this fact sheet should be discussed fully with your independent agricultural consultant before any action is taken by you. No responsibility will be accepted by AuSPICA for any loss or damage suffered by any one as a result of the information contained in this fact sheet.

Version 1.0 2010