INTERPRETING IN-FIELD CROP KNOWL

Growers can limit the risks of rots and other diseases developing after harvest by taking intelligence from the crop and interpreting it for the storage period, says potato specialist Dr Stuart Wale (SAC Consulting).

He advises prioritising care of crops identified as at risk so that timely decisions can be made.

"Knowing your variety is key to management, so attention to detail starts prior to planting. Whatever varieties you are growing, you need to research it first to identify its specific susceptibilities to understand the risks you are taking on," says Stuart, who recommends consulting the AHDB Potato Variety Database.

"Another source of variety information is the European Cultivated Potato Database but the data is from a wide variety of testing organisations which leads to variation in results.

Susceptible varieties are at higher risk of infection and for some diseases, risk increases further when crops are exposed to stress conditions such as extreme heat, drought or waterlogging. Long-lived soil-borne fungal pathogens such as Black Dot (*Colletotrichum coccodes*) can be a particular problem in some susceptible varieties, including Maris Piper. "The longer the tubers are in the ground, the higher the risk of Black Dot, so if you know you are growing a crop that is at risk, you may want to prioritise it when working out which to harvest first," says Stuart.

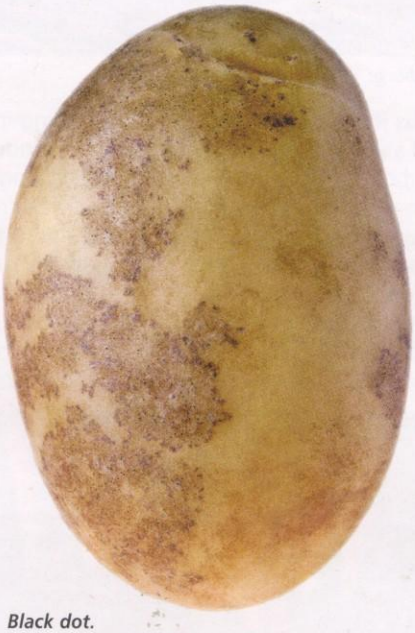
Another such disease is skin spot (*Polyscytalum pustulans*), a fungal disease of potato tubers which does not show symptoms in early storage, generally appearing after three months. These blemishes reduce market value, particularly for crops destined for ware, and processing crops might require extra peeling.

Stuart says: "Recognising skin spot on input seed is important to identify risk but skin spot is not easy to see and diagnose correctly as it can look like a raised lenticel. The good news is that there are only a few very susceptible varieties such as Arsenal and King Edward."

Measures to ameliorate such risks include applying an effective seed tuber fungicide treatment and prioritising the crop for an early harvest.

He goes on to note that crops with significant blackleg in the field can lead to soft rots in store as the bacterial infection can move via the stolon to the tuber. Blackleg bacteria can also move through the soil to daughter tubers and invade wounds and lenticels to initiate soft rots.

Ensuring crops with blackleg or showing tuber soft rots at harvest, which can rapidly spread bacteria across tubers, are cooled and dried as soon as possible after entering into store will be important. "Once in store, most diseases can be minimised by rapid drying, but although wound healing will be faster at warmer temperatures, there may be times when tubers need rapid cooling too.



Black dot.

Avoiding condensation and keeping tubers dry, is key to reducing not only the risk of incidence of bacterial diseases, but also a range of fungal tuber diseases. "Ideally there will be a store manager monitoring and controlling the tuber conditions, taking the appropriate measures and keeping accurate records for future reference."

Harvesting impacts on store diseases

Haulm destruction needs to be uniform and complete to ensure that harvest can be achieved in good time, says Stuart. About 90 percent of growers in Scotland are now using flail and spray, and he has found that it does seem to achieve a rapid and uniform kill. "The trick is to ensure the haulm is completely dead, as if

Call for tuber samples with fusarium dry rot

Fusarium dry rot, which is both seed and soil-borne, is one of the most important post-harvest tuber diseases, causing breakdown of potatoes in storage. There are a number of Fusarium species associated with this condition, and some of these are controlled by fungicides, whereas others are insensitive to them. Stuart says: "It is a sporadic disease, and some varieties are more susceptible to it than others."

The potato team at SAC are surveying this important disease and would like any growers and agronomists who could send samples for species identification to contact him by email in the first instance at; stuart.wale@sruc.ac.uk

...OGE FOR BETTER STORAGE

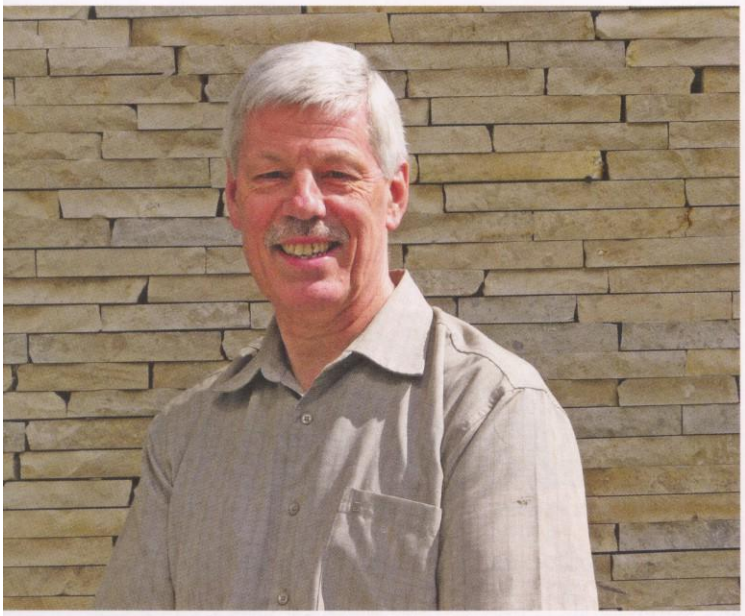
Check-list of factors affecting storage tuber disease

- Check variety database for varietal susceptibility to disease.
- Check seed tuber health before planting and apply appropriate seed tuber fungicide treatment if required.
- Review weather conditions during the growing season and monitor:
- Crop stress
- Field disease
- Check haulms have been evenly destroyed, skin set is complete and stolons have been detached.
- Consider date and weather conditions at harvest and duration of crop in the ground.
- Check for soft rots and disease, mechanical damage and bruising during harvest and take the relevant action.
- Monitor dry matter and tuber damage levels.

it is partly green you may find you are pulling the plug where the stolon is attached to a tuber, leaving a hole for disease to get in."

As yield in unirrigated crops are down this year, at least in the north of the UK, many growers are having to make judgement calls on whether to delay harvest to get a better yield at the risk of loss of tuber quality. Delayed harvest can make crops more vulnerable to rots and other tuber diseases, as the longer they are in the ground the higher the risk of all tuber storage diseases (except dry rot), so Stuart recommends opting for better quality at the expense of a little extra yield.

"As September proceeds, solar radiation falls away quite quickly and crops take more time to bulk. This means quality can be compromised. In addition, a later harvest, in cooler and wetter conditions, means that wound healing takes longer and that there is more time for fungal and bacterial inoculum to build up and threaten the harvested crop."

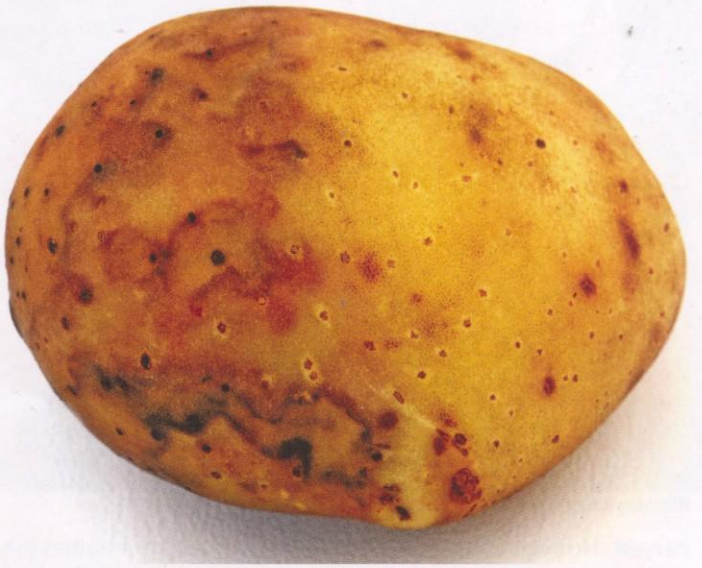


Dr Stuart Wale.

Wet or dry conditions at harvesting make a difference too. For example, mechanical damage during lifting was more of a threat in dry conditions or on light land, creating greater opportunity for pathogens to enter the tuber.

Many of this year's unirrigated potato crops, in Scotland at least, have dry matter (DM) levels generally two to three percent higher than normal, which may mean they are more susceptible to bruising. "This was particularly noticeable in crops that were lifted early when dry conditions meant there was a lack of soil on the primary harvester web.

"Most growers are well aware of this risk, and have been hotboxing to check crop samples. Some growers irrigated at or after haulm destruction to make sure there was enough soil to buffer the tubers on the webs and ensure turgidity of tubers at



Blight tuber.

Blackleg infestation.

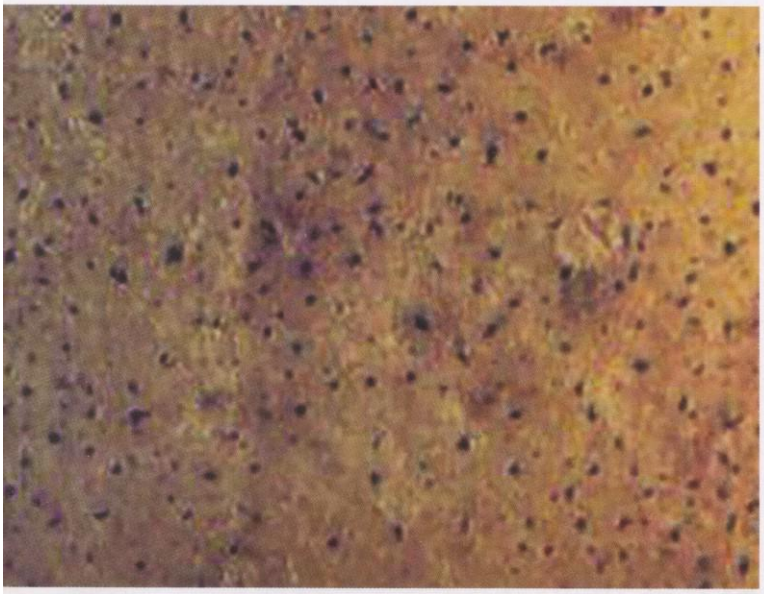
harvest. However, the recent rainfall means that more soil is coming up with the tubers, so this threat has receded."

Good management starts well before planting

Keeping records with notes of any issues previously found in potato crops in any particular field can also be helpful, points out Stuart. "For example, noting down if you have watery wound rot, or Spraing can help you to make better informed decisions, and makes it easier to identify risk from the same disease when growing potatoes in the same field next time round."

Some diseases survive in soil between crops as tough long-lasting resting spores, he adds. However, as many of the fields used for growing potatoes are rented, knowledge of the field history is often not available. Stuart says: "You may not influence the survival of soil-persisting field diseases, but you can reduce the impact they can have in store by good crop and field intelligence."

"Crop intelligence is recording what happens in the field and knowing what issues affected crops in store. A risk assessment of disease for each crop in store is crucial for decisions on what to take out first. Often the team is so busy at harvest that there is no-one left in charge of the store, but where there is a store manager, it is their responsibility to ensure storage starts off on the best possible footing." ◆



Close up of Black Dot.