

## Physiological issues with potato tubers during storage

Potato tubers are living organisms that go through a number of physiological processes during storage, such as respiration and dormancy. These processes are affected by a variety of factors, which determine the quality of your potatoes and their resulting value in your market of choice. It is therefore crucial to regularly sample and assess the quality of your potatoes during storage, to identify and address any problems before it is too late. We highlight a couple of known examples in this month's bulletin: **blackheart** and **senescent sweetening**.

### Dealing with defects you cannot see

**Blackheart** is a physiological disorder of potato tubers. Affected tubers are particularly difficult to detect because they appear perfectly healthy externally. Inside, however, symptoms typically occur at the centre of the tuber and include necrotic tissue, often with some cavities (pictured below). This can have significant financial implications for suppliers and retailers in the fresh potato industry. Although the onset of blackheart is poorly understood, research has revealed that it tends to be associated with oxygen deprivation. Here is a reminder of more recent AHDB research undertaken in collaboration with Cranfield University with support from the Fresh Potato Suppliers' Association.

Work at Sutton Bridge focused on establishing a test protocol for identifying varying levels of susceptibility in varietal stocks and identifying risk factors associated with blackheart throughout storage and during shelf life. Findings confirmed that blackheart is mostly observed during shelf life, following washing and packaging. Three main factors were identified as contributing to an increased risk of blackheart: long-term storage, particularly at very low temperatures (<3.5°C), tuber size (prevalence in tubers larger than 60 mm) and variety choice (varieties differed in susceptibility).



Research findings from Cranfield University focused on the physiological and biochemical profile of blackheart. Sugar accumulation was found to be more prevalent in susceptible stocks.

These experimental trials shed some light on the risk factors associated with blackheart, but further work is still required to expand the number of varieties tested and to paint a more detailed picture of blackheart susceptibility in the fresh-packed potato landscape. Full reports on the trials undertaken, together with a literature review and advice for growers on how to assess risk, can be found [here](#).

For further tips and guidance on how to manage blackheart and other physiological defects, contact Sutton Bridge Crop Storage Research on 0800 02 82 111 (free for levy-payers) or alternatively, email [sbcsr@ahdb.org.uk](mailto:sbcsr@ahdb.org.uk).

### *Does your stock show unusual defects?*

More recently, SBCSR has been trying to diagnose another problem of internal discolouration which appears to be of physiological origin. Have you seen this or a similar defect? If so, perhaps collective, anonymous information on the agronomy and storage of other samples may help implicate or eliminate causal conditions.

There are no external visible symptoms and no pathology is associated with the symptom. It has not been reported as occurring during early storage, which may indicate that severity increases with storage or it may simply have been missed during early storage.

Symptoms of typical blackheart can be induced in the samples and have a different spatial distribution and internal structure to the defect.



Please contact [Glyn Harper](#) or Graeme Stroud on 0800 02 82 111 to discuss any samples or comments you may have.

### Senescent sweetening: What to look out for and how to prevent it

While late planting may have improved the opportunity for marketing potatoes left in store from 2017, don't let this late season problem undo all your hard work. Tubers have evolved as potatoes' mechanism simply for surviving winter. Routinely storing for 10 months is actually asking a lot – and some varieties aren't up to it. A lot of storage for processing is about avoiding low temperature sweetening but, at this time of year, we need to think about **senescent sweetening**.

Senescent sweetening is related to the physiological age of the crop; it is critical to detect it, because it is irreversible. Factors that encourage greater physiological age, such as earlier tuber initiation from chitting in cv Saturna, early planting in cv Maris Piper and warmer storage temperature in both cultivars result in more risk of deterioration late in storage. While reconditioning (holding crop at warm temperature) may improve quality in potatoes that have suffered low temperature sweetening, this will only make matters worse in potatoes which are senescing. Carry out regular fry colour checks, watching for any hint of a drop in quality so your crop can be marketed before senescent sweetening becomes a problem. Don't get caught out!

An AHDB review of senescent sweetening is available [here](#) for further information.

More recently, Dr Claudia Carvalho at Greenwich University completed her PhD studies looking at senescent sweetening in a range of processing varieties, with funding from AHDB. During her studies, Claudia observed fracturing of the surface of starch granules in potato tubers and identified a possible link with anti-oxidant activity – the method by which cells are protected from harmful chemicals. These traits could potentially be used as markers for senescent sweetening in the future. A report on Claudia's work, entitled 'From

understanding mechanisms and identifying markers for the onset of senescent sweetening' can be found [here](#).

## Storage snippets

### Latest guidelines for tuber late blight control in the light of reduced sensitivity to fluazinam



AHDB's 'Fight Against Blight' monitoring network reported an increase in the prevalence of the aggressive EU\_37\_A2 *P. infestans* strain in 2017. First reported in the Netherlands in 2013, it made up 24% of the samples collected by blight scouts in 2017, compared to only 6% in the previous year. This prevalent strain is also less sensitive to fluazinam, a fungicide commonly used for foliar and tuber late blight control.

Effective disease control forms a fundamental part of potato store management and is crucial for maintaining a high-quality crop. The increasing prevalence of the 37\_A2 strain and its reduced sensitivity to fluazinam is a concern for potato production but even more so for potato storage. The challenge post-harvest comes in the limited availability of highly effective tuber blight control modes of action aside fluazinam.

AHDB, in collaboration with SRUC and ADAS, has published a set of control guidelines and recommendations for the potato industry available [here](#). Reducing the chances of disease development is crucial and effectively starts pre-harvest with measures including but not limited to:

- Knowing whether 37\_A2 has been confirmed in your area
- Growing cultivars resistant to potato late blight, like Agria or Desiree
- Achieving good haulm desiccation to prevent blighted re-growth
- Using multi-site fungicides

Fluazinam forms a major part of our armoury for late blight control, whether at the production or storage end of the potato supply chain. We therefore strongly encourage growers and store managers to carefully follow guidance to minimise the risk of spreading the 37\_A2 strain and its reduced sensitivity to fluazinam.

Visit our [main blight page](#) for more information on the disease and its management.

AHDB are currently seeking volunteers to report appearances of the first symptoms of potato late blight. If you are interested in becoming a Blight Scout you can do so by registering for AHDB's Fight Against Blight by visiting the [website](#).

### The latest on CIPC regulations

Under EU law, approvals for active substances can only be granted for a maximum of 10 years, before a review has to take place. The current approval for chlorpropham (CIPC) expires in summer 2018. The European regulatory review of CIPC is on-going and will be discussed at the Standing Committee on Plants, Animals, Food and Feed (SCoPAFF) at its May meeting. In the review, a number of data gaps have been identified relating to consumer risk assessment for the plant growth regulator's use, leading to a 'critical area of concern'. It is anticipated that a vote on whether to renew CIPC's approval will take place at the SCoPAFF meeting in July.

## Monitoring glycoalkaloid levels in your potatoes

A recent case of poisoning from a potato dish in Germany has prompted the German Federal Institute for Risk Assessment (BfR) to review the recommended dosage of glycoalkaloids per day for adults.

Glycoalkaloids are naturally present in potatoes and help the plant to defend itself against pests. However, it can lead to poisoning in humans if ingested in large amounts. Their presence is particularly prominent in green and sprouting potatoes, highlighting the importance of best practice when it comes to potato storage.

The full news article can be found [here](#).

## Key industry servants pass away



We are sorry to have to report the recent death of **Bill Leslie**, former managing director of Farm Electronics Ltd., a major supplier to the potato storage industry. He was 75 and had been battling Parkinson's disease. Bill set up Farm Electronics in 1982 and under his guidance the firm became a well-respected manufacturer of crop storage equipment, with customers throughout the world. Bill had a deep understanding of both agriculture and engineering and was very supportive of research, often attending European Association for Potato Research meetings around Europe. He retired in 2008 passing the baton on to Tim Dudfield and the existing management team, who continue to work from the firm foundations that Bill laid. He is survived by his wife Jenny, daughter Kate and son Ben.

We are also sorry to report the death of **Tony Batchelor**, long-serving former deputy packhouse manager on the commercial team at Sutton Bridge Experimental Station, as our site was known in its earliest days under the former Potato Marketing Board. Tony was 78 and is survived by his wife Marjorie.

## Forthcoming events

### Post-harvest technologies – Innovations for Keeping Crops Clean, Cool and (High) Quality

Wednesday 20<sup>th</sup> June, 14:30 – 18:00

AHDB Sutton Bridge Crop Storage Research, East Bank, Sutton Bridge, Spalding, PE12 9YD

Are you a grower or agronomist interested in how post-harvest technologies can help in maintaining crop quality? Are you a store manager looking towards technology to revamp your stores? If you are reading this, chances are that crop storage is indeed an important aspect of what you do. Following our [new partnership](#) with Agri-Tech East, we are jointly hosting an event where researchers, technology developers and industry experts will explore innovations in post-harvest crop management, such climate control technologies, for short and long-term storage. Adrian Cunnington, Head of Crop Storage Research is one of our speakers and will focus on the importance of airflow in your store and how new tools can improve it.

This event will be a great opportunity to learn from and network with industry and technology experts. In addition, there is an option to see the Sutton Bridge Crop Storage Research facilities and learn directly from the researchers there about ongoing potato storage projects. There will also be opportunity to meet Laura Bouvet, KE manager for potato storage at Sutton Bridge, who works jointly with Agri-Tech East on farmer-led initiatives.

Further information about the event's programme and registration can be found [here](#). If you are an AHDB levy payer, please ensure you email [becky.dodds@agritech-east.co.uk](mailto:becky.dodds@agritech-east.co.uk) directly to register.

## **SPot Farms: Open Days and Field Walks**

### **SPot East – Elveden Farms, Thetford, Suffolk**

Dates for the diary

Field walk – 31 May

Open Day – Thursday 5 July

Field Walk – Thursday 2 August

Field Walk – Tuesday 4 September

### **SPot Scotland - Bruce Farms, Meikle, Blairgowrie, Perthshire**

Dates for the diary

Open Day – Tuesday 10 July

### **SPot West – Heal Farms, Shawbury Nr Shrewsbury, Shropshire**

Dates for the diary

Event - 28 June

Event – 27 July

### **SPot South West - Dillington Farms, Ilminster, Somerset**

Dates for the diary

Open Day – Tuesday 31 July

### **SPot North – Somersby Top Farm, Brigg, North Lincs / East Yorks**

Dates for the diary

Open Day – Thursday 19 July

Field Walk – Thursday 16 August

Field Walk – Tuesday 18 September

For a full programme of events and details of how to register, please go to <https://potatoes.ahdb.org.uk/events>

### Potatoes in Practice

Thursday 9<sup>th</sup> August, 08:30 – 16:30

James Hutton Institute's Balruddery Farm, Fowlis, Dundee, DD2 5LJ

A one stop shop for the UK potato industry, Potatoes in Practice brings together a variety of stakeholders in the potato supply chain. Researchers and breeders right through to agronomists and processors will be on hand to share their expertise and provide advice. Exhibitor space is available. Click [here](#) to find out more about the event. Registration is free and will be opening soon so watch this space.

### Storage in Scotland

Thursday 30<sup>th</sup> August. Save the date: details to follow.