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Potato webinars

Storage finesse

With the knock-on effect of the wet spring delaying harvest for many, plus the burden of high energy costs, it could feel as though the odds are stacked against efficient and effective potato storage this year. CPM attended a series of webinars which explored mitigation tactics.

By Janine Adamson

Growing potatoes in the UK is becoming increasingly risky business. Before even considering the cost of inputs, extreme weather during the past few years – from drought to flooding – has meant in some cases, growers have had no choice but to turn their backs on the crop, despite the nation’s continued demand.

This year has been no different – delayed planting due to the wet spring has meant a late harvest in many cases, which brings about its own challenges, including in-store. And at that point

in the crop’s lifecycle, there are high energy costs, aging infrastructure and navigating the nuances of newer sprout suppressants to contend with.

Recognising the perfect storm of challenges this season is what instigated UPL to deliver a series of webinars, collaborating with industry experts and growers to share advice on store management and maximising returns.

Hosted by technical lead Geoff Hailstone, one area which the presenters agreed requires more attention, is improving store insulation.

Study insights

As such, Norfolk farmer Mark Means explained the techniques he’s deployed. “I was fortunate to be involved in a study in 2011/12 with the British Potato Council about energy useage. We had a meter installed and plotted the tonnage we had in against the energy we used, which highlighted the more we could improve insulation, the better we would do.

“We learnt from that study, which compared the farm against around 10 different stores on different farms, that we weren’t anywhere near the best.

“Following this, we re-foamed one of our stores (50mm), which happened in 2019 just before the electricity price hike. That dropped our consumption for a more ambient store of 8oC by 25-30% because it prevents cold

air from getting in,” he said.

Mark shared that he believes it’s worth the investment. “At one point when energy was cheap and renewables were the focus, I thought we didn’t have to worry so much, but I’m glad we pursued it.

“Another learning was when we built one store, which has 100mm of insulation on the roof and 80mm on the sides composite panel, they can leak. So I asked Adrian Cunnington to assess the building using an infrared



Grower Mark Means recommended checking the specification of store roof fans as some can cost more in electricity to run than they’re actually worth.



Although maleic hydrazide appears expensive to apply within the growing season, if it's evaluated more broadly, it's around half the price of an in-store suppressant, advised Simon Faulkner of SDF Agriculture.

► camera to identify the weak spots. "Following this, a foaming company injected the gable ends – from the roof section meeting the side section, and around the doors. But not long after, we realised we'd sealed it too tightly so added a venting system to keep CO₂ levels down.

"We have to assume that any chance to improve insulation, do it, but subsequently, make sure you regularly monitor CO₂," he stressed. Simon Faulkner of SDF Agriculture agreed that thermal imaging is a useful diagnostic tool. "You should be making notes during the storage season and assessments for remedial work when stores are empty. You'll know throughout the season where weak spots are, where the warmer tuber temperatures are located, then undertake corrective action in the summer," he advised.

Besides insulation, Mark raised there are other techniques which can reduce energy costs by improving air movement around stores. "We use curtains to concentrate the air through the pallet ends.

"In a couple of stores we've even explored having the fridge pointing away to try and improve the consistency of speed. Perhaps a little unorthodox, but having done this in my longest term store, it's better for weight loss because the speed of air crossing over the top of the tubers has improved in evenness."

He also explained that the farm has received grants in the past to install inverters on the main fans, the compressor and condensers, as well as electronic

expansion valves. "It's even as simple as the fans in the roof – check their specification. Some can be running for a long time during the season and cost more in electricity than the fan is worth. You have to monitor your energy consumption.

"Remember for any inverter or electric fan it's R³ – so if you can reduce its requirements from 100% to 80%, that's 0.8 x 0.8 x 0.8, equivalent to a 50% reduction in energy consumption. However, if you do that on your evaporator fans then they could be colder and the temperature difference (TD) and therefore risk of weight loss increases. This reinforces the importance of working with a fridge engineer," he explained.

Positive ventilation

Simon reminded growers that the consideration should be to aim for positive ventilation, or as close to it as possible, before embarking on building new stores. "Making the most of what you have is a cost-effective compromise. In the case of over-head throw stores, you can install curtains around the sides and over the top of evaporator fans to ensure the air is coming back through the pallet ends, continues through the potatoes and doesn't short-circuit down the side of the building.

"The reversing of the fridge could sound bizarre, but it improves airflow back into the coil reducing 'dead spots' in front of the coil when facing the conventional way. It aids movement out of the corners – another 'dead spot'.

"These techniques plus insulation and inverters will all help to reduce costs or kilowatt consumption at least," he added.

Mark admitted it's a complicated subject and involves investment of time. "You have to understand what you're trying to achieve or you can land in quite a muddle.

"And I don't think you can necessarily do it remotely – I still want to visit stores, smell, feel and touch, to give it a proper look over. There's no substitute for seeing a light has been left on or a door left ajar, you have to be in a store quite regularly," he commented.

Aside from energy, another costly potato store input is sprout suppression. Although applied in-field, Simon highlighted the growing popularity of maleic hydrazide (as in Fazor and Crown MH), particularly in long-term storage scenarios.

"It's been around for years but as growers become more adept in using it, it's become a no-brainer for ware crops.

"MH does look to be an expensive

product to apply within the growing season, but if you evaluate it more broadly, it's around half the price of an in-store suppressant. If it can save one in-store treatment, it's been worthwhile," he urged.

One such option available to growers is ethylene which although is cost-effective, can compromise fry colour as well as require greater management of CO₂ levels, said Simon.

Adrian Cunnington of Potato Storage Insight added that ethylene is a plant hormone and therefore evokes a different response depending on the variety, particularly in relation to respiration rate. "Those marketing products are therefore trying to adapt the introduction of ethylene to stores. Nonetheless, it's a good option for some markets so an important player to have in the mix," he advised.

Exploring other available in-store suppressants, Adrian pointed out that DMN (1,4-dimethylnaphthalene), spearmint oil and orange oil are all volatile active ingredients. "Spearmint oil has been around for about a decade and is used considerably in the fresh market. It had a year after the loss of CIPC when it was used extensively and demonstrated its flexibility in that season.

"Subsequently, other players have come into the market most recently DMN and orange oil. All are volatile and have to be applied carefully – I stress



UPL's Geoff Hailstone hosted a range of webinars which collaborated with industry experts and growers to share advice on store management and maximising returns.

wherever we use these volatiles that we can't assume it's the same as a CIPC application; it's completely different."

He explained that DMN should be applied relatively early during a storage period as a 'dormancy enhancer' whereas spearmint and orange oil offer contact action and are effective at controlling existing sprouting.

"DMN seems to have found its niche – a lot of crops are being treated with it and it seems to have gone on well during the past 2-3 seasons which is encouraging as a product to supplement MH. However, it doesn't suit all markets and is relatively expensive," commented Adrian.

"For orange and spearmint oil, you potentially require multiple applications due to their volatility and therefore they don't remain in-store for long periods of time or offer the same residual control as MH. There are also differences in shelf-life and harvest interval to observe for all of the volatiles."

Suggesting a sprout suppression programme, Adrian said MH could be perceived as a base treatment with DMN being applied early during storage followed by orange oil towards the end.

In response, Simon stressed the importance of monitoring. "One of the

unintended benefits of losing CIPC is store management has become better with improved attention to detail, store design and box layout – that's enabled these newer products to work well.

"Check with your customers regarding their preferences – mint oil has a strong smell and although that's no issue, it can put people off. But again, it comes down to monitoring – you don't want to be treating a store with mint oil if it's being unloaded the following week. Customer discussions are important as we get deeper into the storage season.

"This is why MH is so critical and testing stored tubers for residue levels will help to make better storage decisions on crops stored later in the season."

Adrian added that getting the best out of all of the available sprout suppressants remains a challenge. "You have to understand how the products are going to respond to being applied within your specific store. If you have a leaky store, volatile products can prove a short-term treatment and you'd have to go back again.

"And that's not ideal, so you may want to look at changing the type of product, or of course, do remedial action and rectify.

"Whereas in box stores, application



Potato Storage Insight's Adrian Cunnington highlighted that getting the best out of all the available sprout suppressants remains a challenge.

can be governed by how effectively the boxes have been loaded and whether they're orientated correctly to maintain air control and deliver chemical to the tubers. Any compromise will show up quickly in terms of sprout control," he concluded. ■

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