

# The little things that make all the difference



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DR ALISTAIR WRIGHT

**On-farm hygiene plays a major role in mitigating threats from difficult-to-control beet pests and diseases. CPM reports.**

By Mike Abram

**A**rguably, most of the difficult agronomic pest and disease challenges in sugar beet production can be reduced through one of the oldest basics in farming: excellent on-farm hygiene and use of related cultural control methods.

"It's risk management," suggests Stephen Aldis, head of field operations for BBRO. "These techniques can be deployed very successfully, but their role in creating security for following crops isn't always considered. I'm not sure growers always realise the threat that poor on-farm hygiene poses."

Good on-farm hygiene helps with many of the agronomy challenges beet growers face, stresses Dr Alistair Wright, head of crop protection for BBRO.

That includes virus yellows, which is the greatest disease threat currently to the beet crop. "It's long been recognised that

one of the highest risks is poor hygiene allowing carryover of aphids and/or virus to the following crop," he says.

Beet clamps, self-propelled loader runs, spoil heaps or groundkeepers can act as a reservoir for virus infections or homes for overwintering aphids, and should be destroyed in a timely fashion, ideally several weeks before drilling starts next spring, adds Stephen.

That can be done through either using glyphosate or cultivation. "While weather will have the greatest influence on virus yellows risk, on a field-level, avoid creating conditions where aphids can move easily from beet or other hosts to newly emerging beet crops.

"Try to avoid building clamps on fields that are going to be beet next year – if it's unavoidable, the area should be ploughed down after to bury any beet remnants."

On-farm hygiene also helps with two other emerging threats to sugar beet production: cercospora and beet moth.

For the former, which is being found in virtually every field this autumn, it's residue management, particularly of leaf material that is key, points out Alistair. "That firstly comes down to good



## High risk

BBRO's Stephen Aldis says he isn't sure growers necessarily realise the threat that poor on-farm hygiene poses.



## Beet moth research strategy

BBRO will publish its beet moth research strategy this winter, which includes looking at the role of on-farm hygiene and the carryover of moths, highlights Dr Alistair Wright.

topping of the beet. You don't want leaf material being carried into clamps because that'll leave a concentrated area of inoculum for future years."

Ploughing after the beet crop or areas on fields where clamps have been located away from the beet field will reduce disease carryover. "If minimum tillage is used the residue won't be buried and is free to sporulate in following seasons," adds Alistair.

"The major risk is where you're

growing beet next to a field that had beet the previous season, especially if it's a split field or where there are no hedges. The spores can be blown from one area to another."

Literature suggests cercospora spores, which are relatively large in size, don't travel more than a few metres, with barriers such as a tree belt – and to a lesser extent a hedge – limiting spread. "But we do know they can travel longer distances if they get taken up into the air, so it's important to maximise the distance between beet this year and beet next year.

"Return spoil from where it came from, as it'll potentially contain many spores. Even if the clamp or Maus line is on a field that won't be beet next year, the spores can be blown to next year's field. We often see the first stage of cercospora damage comes from where a Maus line was."

Less is known about carryover of beet moth, which has been a problem in some of this season's beet crops, suggests Alistair. "It's localised in severity, but you can find it across East Anglia. Some crops are unaffected and yielded well, in others the canopy has gone leading to growers to lift earlier for yield preservation."

BBRO is due to publish its beet moth research strategy this winter, which will include looking at the role of on-farm hygiene and the carryover of

moths, highlights Alistair. "Potentially, moths may overwinter as larvae in any root remnants left in fields or as pupae in soil within their cocoons, which we think are quite protective.

"We know from literature they survive at very low temperatures, so we can't rely on a hard frost to kill them like we do with aphids."

Instead, the research will look at alternative ways to make life difficult for the pest, which will include comparing ploughed with non-ploughed areas of heavily infested crops. "Logic suggests that a little moth, only 1-2cm long, will find it difficult to crawl through 15-20cm of soil with its wings intact if they even make it to the surface."

Emergence traps will test whether the moths emerge, while new pheromone-based traps with cameras that use AI to identify the pest, will be used to compare emergence when the moths reach nearby fields. "The new traps allow us to monitor on a daily basis rather than weekly," comments Alistair.

However, more is known about beet cyst nematodes. "It's important to consider risk and correct variety choice for BCN, but also carryover of cysts into future crops and around the farm," he says.

"Like beet moth cocoons, BCN cysts are very protective of the eggs inside. Eggs are protected for up to 20 years, surviving rolling or any mechanical action in the soil."

That makes it easy to transport the cysts to other areas of the field or across the farm on any machinery, he adds. "You can go from a small foci



## Cultural control measures

For cercospora, which is being found in virtually every field this autumn, residue management, particularly of leaf material, is key.

## Ploughing conundrum

### Playing a valuable role in sugar beet production

**W**hile higher costs, potential soil degradation and loss of organic matter have all seen ploughing come under the spotlight, for sugar beet growers, it remains critical, not least for crop protection, stresses Stephen Aldis, head of field operations for BBRO.

"It should be used strategically for crop protection. In many cases, it's perhaps best used after sugar beet to help manage residues and bury sources of infective material for virus, cercospora and beet moth, where risk is highest."

"You could just plough a localised area," he adds. "It's using it strategically rather than a blanket approach."

He acknowledges that spoil heap management can be tricky where ploughing isn't possible, especially in wet harvests and/or on fields away from the beet field. "Ideally, we want

the soil to go back to the parent field, especially if BCN is a concern.

"But the beet or remains of the heap might not be removed immediately by which time the parent field is already ploughed and drilled. In that case, it either goes back the following spring or to another infected field," explains Stephen.

In wet weather, it becomes harder to move spoil heaps, so they often remain in situ until it dries up in spring, he notes. "These have to be managed promptly when regrowth occurs, either by moving mechanically with a digger or telehandler, or by spraying with glyphosate to minimise virus risk."

"Another way, which we want to explore, is putting a silage sheet over the top in winter to suppress regrowth and contain cercospora spores until it's possible to deal with it," concludes Stephen.

## Supporting on-farm sugar beet trials

### Helping to make the most of trial work

**W**hen it comes to trial work, some questions are better answered using traditional small plot trials, while others are more suited to larger-scale on-farm type work.

Examples of the latter include the impact of growing cover crops before beet, or whether the crop can be established using strip tillage, points out Dr Georgina Barratt, BBRO's head of crop production.

"That's something you have to evaluate in a farming system. A lot of factors feed into whether it'll be successful from timing of drilling, soil type, nutrition, to even tractor availability – things we can't easily replicate in small plot trials."

Even where it is possible to investigate such practice changes in small plot trials, the results from 2-3 sites wouldn't be representative enough to enable hard and fast conclusions to be drawn, she believes.

Recognising that these are the types of practice changes sugar beet growers are interested in adopting, BBRO is

aiming to support growers doing their own on-farm trials, highlights Georgina.

That's started with the production of a 'how to' guide for conducting on-farm trials, but has since expanded into providing consultancy and practical help. "If there's a technology or an approach that you're looking to adopt that doesn't suit small plot trials, we can support with aspects like trial design, to make sure the work gives you the scientifically, robust answers you're looking for, while also minimising risks to your beet crop."

Potentially, that support will extend to yield digs or other assessments, adds Georgina, while she can also advise whether any funding through the Farming Innovation Programme Accelerating Development of Practices and Technologies (ADOPT) scheme could be available in her role as an ADOPT project facilitator.

"We have a form on BBRO's website, similar to the one for sending in samples for the Plant Clinic, for growers to submit their ideas for



#### Practical help

BBRO is aiming to support growers who wish to conduct their own on-farm trials, says Dr Georgina Barratt.

consideration. We won't be able to help with every idea, but we're keen to help with as many as possible.

"Commercially, this kind of support would be expensive, but it's available for free as part of your levy," she concludes.

**BBRO 'How to' Guide:** [bbro.co.uk/publications/on-farm-trials/](http://bbro.co.uk/publications/on-farm-trials/)

► infection to a massive patch in a field in a relatively few passes of a cultivator."

Cysts can also blow on the wind, move on your boots or with livestock, and are hosted by a whole range of crops and weeds. "If you've had it in one field, it's likely to be across a whole block of land."

While that makes it difficult to stop spread, practicing good on-farm hygiene has a place, albeit one with practical limitations, raises Alistair. "Best practice would be to clean down machinery as it moves in and out of every field. That's clearly not a workable suggestion, but think about whether you can work a block in one go and then clean down machinery."

Rotation and use of cover cropping has to be carefully thought about with BCN, as well as virus and other pest threats. "There's a range of risks; radishes and mustards can be fantastic BCN hosts, but also potentially a useful management tool."

Growing BCN-resistant class one species could reduce populations by around 20-30%, proposes Alistair, although based on laboratory tests, breeders claim higher reductions.

"While they are more expensive, growers should be requesting BCN-resistant class one varieties."

Class two BCN-resistant brassicas are also available but are less resistant, suggests Alistair. "They'll probably maintain populations at the starting level, while susceptible varieties or species can boost populations by a factor of 10 or 20.

"If you've used a susceptible brassica in your cover crop before beet, think about destroying it as soon as possible to limit further multiplication, bearing

in mind scheme restrictions."

He adds that other cover crop species can be hosts of virus yellows or aphids – for example, phacelia, forage rape, red clover and vetch. BBRO's cover crop guide is a useful source of information about the risks, concludes Alistair.

The guide ([bbro.co.uk/publications/cover-crop-guide/](http://bbro.co.uk/publications/cover-crop-guide/)) also provides details about risks for other pests and diseases, such as slugs and wireworms, where on-farm hygiene also plays an important role in control. ●

## On the beet

**W**hether it's virus yellows, cercospora, beet moth or diseases transmitted by leafhoppers, the agronomic challenges to growing sugar beet require just as much technical expertise and knowledge as ever.

Add in other factors such as reducing the carbon footprint of beet growing, and this makes a timely series of articles – sponsored by BBRO – exploring how research is helping UK growers to maximise yields, quality and the profitability of their crops.

CPM would like to thank BBRO for providing expert insight and knowledge, and for the privileged access to the individuals involved.

