

How to unseat your foe

“We have to get the crop established, but it also needs to be profitable.”

Technical Battling the beetle

There's a range of tactics currently under investigation to determine the best way to keep cabbage stem flea beetle from taking up residence in your crop of oilseed rape. *CPM* gathers the latest thinking.

By Rob Jones

For many growers, it was the 2018/19 season that showed them they were fighting a battle against cabbage stem flea beetle on two fronts — managing the pest relies on limiting larval damage as much as it does on surviving adult grazing.

Many crops brought through the 2018 establishment storm last season looked good in December only to go backwards rapidly from January under serious larval burdens.

As a result, large areas of OSR were either abandoned in the spring or taken through to a disappointing harvest; courses of action far more costly in wasted inputs than any autumn crop failure.

At the same time, of course, where crops were written off in the spring, that significantly reduces opportunities for their profitable replacement. Just as with badly blackgrass-infested cereals, taking them through to harvest seriously increases future population pressures.

“Quite understandably, much of the

focus of CSFB management has been on early crop survival,” notes ADAS crop physiologist, Dr Sarah Kendall. “However, minimising the damage from larvae is at least as important — both to ensure a profitable crop and to reduce future pest problems.

Half-decent crop

“We have to get the crop established, but it also needs to be profitable. So being content with getting a half-decent crop through the autumn and onto harvest may not be the best course of action.

Sarah believes that dealing with flea beetle must feather in with proven best management practice to ensure crops that aren't difficult to manage and produce a worthwhile yield.

“We have to integrate the most useful CSFB cultural controls carefully into the most productive management regimes. If this means changing when or how we establish or manage the crop we must adjust other elements of our agronomy to fit,” she notes.

Informing her approach are the findings from 14 years of data on more than 1500 sites gathered by ADAS with Bayer and other industry partners in a three-year AHDB-funded integrated pest management project concluded this spring.

The analysis reveals sowing date is the only grower-controlled factor having a significant effect on the pest. Unfortunately, though, the relationship is nowhere near as straight-forward as many have assumed.

“Our modelling confirms August drilling minimises adult damage,” explains ADAS entomologist, Dr Sacha White. “However,

it also shows the earlier the sowing, the greater the larval burden is likely to be; mainly because of the amount of plant growth available to support adult feeding and egg-laying over an extended period. This presents a serious dilemma. Sow earlier and you are more likely to have a crop. But it's also more likely to be a crop full of larvae that yields poorly and may have to be abandoned later in the season.

Alternatively, sow later to minimise the larval challenge and risk not being able to establish a viable crop because it emerges into higher levels of flea beetle activity, is far more vulnerable to adult grazing, and grows away too slowly.

“It's not an easy decision,” Sarah agrees. “On balance, I favour sowing later because, if the crop is a write off, it's better to replace it before investing too much time, effort and money in it. Also, we know from experience ▶



Sarah Kendall says growers shouldn't be content with getting a half-decent crop through the autumn and onto harvest.

Battling the beetle



The earlier the sowing, the greater the larval burden is likely to be, notes Sacha White.

► that it's perfectly possible to bring in over 4.5t/ha from mid-Sept sowing at 26 seeds/m²."

She advocates resisting the temptation to spray an autumn CSFB insecticide in many cases. "With such large populations and widespread pyrethroid resistance, this can do more harm in eliminating predators than good in controlling the pest." For the most reliable establishment without spraying,

Sacha sees earlier sowing as a logical strategy. But only in combination with other approaches to combat larval damage, if adult activity is high, and to manage excessive canopies if it isn't. To minimise larval damage he advocates later drilling, but suggests this should be from the second week of Sept, although this presents its own set of challenges.

So, what strategies does ADAS evidence and experience suggest might be valuable for earlier and later sowing — or indeed both?

Know when not to go

Both Sacha and Sarah insist that drilling into moisture — rather than the hope of it — is fundamental. This goes hand-in-hand with a good seedbed, consistent sowing depth and effective rolling for maximum seed-to-soil contact. Knowing when not to sow OSR is important, they maintain, and — again like blackgrass management — having enough rotational flexibility to sow something else instead.

Seed rates are often increased in a bid to reduce percentage leaf loss and definitely results in higher plant populations, according to the ADAS analyses. But this brings no discernible effect on larval numbers per plant — higher sowing rates

simply mean more larvae per field.

"While higher seed rates with farm-saved seed may help crop survival, we generally find little yield benefit from rates of more than 40 seeds/m²," reports Sacha. "Add the extra risk of weaker plants, the danger of less productive canopies and the likelihood of higher pest populations for the future, and we really wouldn't advise pushing up rates."

The analyses suggest a tendency for less beetle damage with declining intensities of cultivation; a finding supported by a recent BASIS project revealing markedly lower larval numbers in direct drilled crops, but one needing far more investigation before firm ►



Many crops looked good in December 2018 only to go backwards rapidly from January under serious larval burdens.

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Rethink required for OSR viability

With many years of frustrating commercial and trials experience with flea beetle behind him, Hutchinson's technical manager, Dick Neale is convinced that taking a long-term approach is the key to addressing the problem if OSR is to continue to be viable.

"For just about every possible management technique, we have as many growers who find it doesn't work as those who believe it helps," he stresses. "This year we put a wide combination of elements together in our trials — leaving a long stubble; choosing a high vigour variety; using a starter fertiliser; and upping seed rates. We even managed to sow into some decent moisture. But we still lost the lot, regardless of when we sowed.

"Waves and waves of migrating beetles in dense swarms like aphids on an early summer day completely overwhelmed the crops. Under these conditions, it makes no difference how many are diverted into trap crops, confused with companions or manuring, or intercepted in spider's webs. They are just the tip of the iceberg."

Also frustrating is the lack of association between autumn pest pressure and the number of beetles seen at harvest, making this no reliable predictor of problems, he says.

Under these circumstances, Dick believes our whole approach to management has to be based on the biological fact that fields with high levels of flea beetle larvae will inevitably generate large adult populations going forward.

"The solution is simple," he reasons. "Where we have big problems in an area we have to sow less OSR the following autumn. Growing beans or linseed as an alternative will break the flea beetle cycle, allowing us to go back to OSR again.

"At the same time, we must up our establishment game with well researched variety-based management recipes for earlier and later drilling based on the best field-scale trial evidence," says Dick.

"This has to include not having more OSR in our plans than we can reasonably sow in a 4-5 day window; only sowing when — and if — we have enough moisture in the ground; and reining back on pyrethroid spraying to give predators a chance."

Once flea beetle pressure has declined, trap and companion crops could be useful to help keep them in check, Dick believes. Winter defoliation might have a place too, although the consequences for crop recovery, pigeon and weed control need to be carefully considered. And screening may allow



Dick Neale believes growers in high infestation areas should work towards breaking the flea beetle cycle.

varieties tolerant to adult feeding or larval development to be added to the mix.

"Overall, it's probably only sustainable to grow OSR one year in five or six," he suggests. "Which means a national crop of around 500,000 ha, not the 750,000ha it had reached, nor the 350,000ha it may have declined to by the coming harvest.

"Just like wheat-growing on bad blackgrass ground, a combination of sound rotational and other cultural controls in a determined recovery plan offers the only solution to CSFB in my view. A radical rethink has far greater benefit than tinkering at the edges."

Providing bespoke nutrition advice is at the very heart of our agronomy service. Working closely with farmers, our FACTS qualified agronomists draw on technical data from our replicated trials and SOYL precision services to create nutrition programmes based on each field's specific requirements for both macro and micro nutrients.

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Battling the beetle



If CSFB adults are drawn into volunteer OSR, once they're feeding and mating their wing muscles weaken, making them much less mobile, so they're trapped.

▶ conclusions can be drawn.

As yet, ADAS also has insufficient science to support companion cropping. However, their studies across several sites over two years are showing that delaying the control of volunteer OSR from the previous season can give significant reductions in adult numbers, feeding damage and larval populations in neighbouring crops.

Obvious promise

"This technique has obvious promise because we know flea beetle use the breakdown products of glucosinolates produced by OSR to locate crops and can't distinguish between planted crops and volunteers," Sacha points out. "Once they're feeding and mating their wing muscles weaken, making them much less mobile, so they're trapped.

"To be effective in diverting flea beetle from planted crops, our trial work shows the volunteer trap crops need to be close by and left green until late Sept. This can take valuable pressure off OSR plantings at their most vulnerable stage and



A technique showing considerable promise for larval control in ADAS work is winter crop defoliation

would fit particularly well where wheat crops are being drilled later in the battle against grassweeds.

"Catch or cover crops with a decent brassica component might be equally valuable here too. They will need to be sown sufficiently far ahead of the OSR for this to work, though."

A technique showing considerable promise for larval control in ADAS work is winter crop defoliation — either by cutting or with sheep grazing. Drastic though this may be, both plot trials and field-scale investigations have resulted in significant reductions in larvae.

"Providing the defoliation is ahead of stem extension and spring growing conditions are reasonable this can be done without significant yield loss," says Sacha. "To be safe, I'd always defoliate well before the end of Jan. I'd also only do it with a well established crop, so it's probably more suitable — as well as necessary — following earlier drilling. And I'd prefer a variety known to be especially vigorous in its spring growth."

Whatever approach is taken, Sarah insists it's essential to

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In this series of articles, Bayer is working with *CPM* to share the widest possible experience of leading researchers and advisers in combatting the upsurge in CSFB that is causing such a challenge for so many growers across the country.

For Bayer, this is part of its Dekalb seed brand's role in providing trusted support to OSR growers and their agronomists that goes well beyond the most robust and dependable varieties that have always been its trademark.

We very much hope growers will find this series valuable in identifying current and future OSR management opportunities they can put to effective use in minimising the threat CSFB presents and securing the most reliable returns from this vital component of modern combinable crop rotations.



have a firm strategy that integrates key flea beetle management controls with established best OSR growing practice.

"Earlier drilling, for instance, needs to be accompanied by much more focus on controlling larvae and spring canopy management," she urges. "It's also likely to require varieties with particular resistance to phoma and light leaf spot and first-class standing ability; plus a careful watch-out for early season pests like cabbage root fly.

"Equally, drilling later will put the onus on the most vigorous, fastest-developing varieties; particular attention to seedbed conditions and management; and a spring programme involving earlier nitrogen, sulphur and low rate PGRs.

"In our experience healthy, well-structured soils with good levels of organic matter make all the difference in dealing with the extra risk that flea beetle brings," concludes Sarah. "They are as important as any other single element of an integrated pest management approach." ■

NIAB tracking confirms increasing CSFB severity

If proof were needed of the escalating scale of the problem, the latest annual NIAB cabbage stem flea beetle surveys provides it in spades, revealing a crop establishment failure rate of 30%.

This is dramatically up from the 13% reported last season, despite generally more favourable early crop establishment conditions. Both surveys attracted a large response, with over 1100 reports from farms across the country this season.

NIAB OSR specialist and survey organiser, Simon Kightley accepts the results will be skewed by the involvement of those with the worst CSFB experiences. However, as this will also have been the case in the previous season, he is confident they reflect a real

difference between the years.

"We've run five surveys to date and the last two showed by far the greatest damage from the pest," he notes. "In the very dry autumn of 2018, 31% of our respondents reported severe damage or complete crop failure. Even though early soil moisture levels were much better, this increased to almost 50% last autumn. We definitely had more reports of serious CSFB problems from further west and north than previously too.

"As we've consistently seen in our surveys, the level of damage and crop failure last autumn again increased with delay in sowing; the least damage being reported from crops sown earlier in August and the greatest from early September



The last two surveys of five conducted to date showed by far the greatest damage from CSFB, notes Simon Kightley.

drillings. That this was, in part, related to soil moisture conditions was underlined by 80% of those experiencing crop failure identifying drought as the secondary factor responsible for it," adds Simon.