



Working together

Companion cropping

When considering planting a companion crop with oilseed rape, it's important that it will help and not hinder the cash crop. *CPM* explores the nuances of selecting the right species for the situation.

By Melanie Jenkins

Companion crops are increasingly being utilised alongside oilseed rape to help the brassica combat pests, improve rooting and scavenge nutrients. But each farm is unique, so tailoring any decisions to the situation is of vital importance.

For Steve Corbett of Agrii, whether or not to plant a companion crop hinges around soil type, conditions and moisture content and he advises approaching the decision with purpose while being clear about the objectives.

"You can soon add £30-£40/ha in cost of production when growing a companion

crop, so selecting the right species and variety can make all the difference."

As a brassica, OSR is a lazy rooter, so soil structure is critical in allowing roots to extend up to 1-2m deep and be optimally efficient, he explains. "If there are any compacted zones in the soil, OSR roots will travel laterally which can compromise yield and nutrient use efficiency. And if soils dry up and the crop runs out of water, a shallower rooted crop won't be taking up nutrients, which is why it's critical to get the growing medium right."

Species selection

So this is one way companion crops can help, says Steve. "Certain companion species can penetrate more compact soil zones, allowing OSR to follow the roots through. Vetches have a very good rooting system so are a useful companion in instances where you're trying to encourage deeper rooting."

In situations where friability in the shallower soil profile requires improving, phacelia's fibrous, shallow roots can help, says Steve.

"Linseed and berseem clover also have strong, powerful roots which can aid establishment, with the latter also adding a little N to the system. But berseem clover can be difficult to grow on heavy soils and is quite expensive, plus pea and bean weevil can be an issue, meaning it's ▶

"I wouldn't contemplate growing OSR without companion crops now as it brings so many benefits to establishment and the system."



Growing a companion crop can add £30-£40/ha in cost of production, so selecting the right species and variety can make all the difference, says Steve Corbett.



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▶ vulnerable at emergence.”

Buckwheat can also be grown as a shallower rooting companion crop that will scavenge for nutrients, but it's essential to select the appropriate variety for the situation. He believes buckwheat's main advantage is to help provide cover for establishing OSR plants, hiding them from migrating CSFB, but says it can prove hard to establish on heavy land.

John Vickery of Agrii agrees, adding that buckwheat's fast growth habit means it shoots up above most stubbles ahead of the emerging OSR. “However,

this isn't a fool proof solution as there has to be moisture and a bit of luck.”

As well as foiling CSFB, buckwheat mines phosphate, pulling it from the soil pool to make it available for the OSR crop. It's also beneficial from a mycorrhizal perspective, he says.

Fenugreek is another companion species which can be used to help deter CSFB as it's believed to emit a curry-like aroma. He also notes that there's a fine line between a companion species working with the crop and working against it, effectively

Fitting the farm

Companion crop species and varieties should be selected on a per farm basis rather than as a prescriptive 'one size fits all', according to RAGT's Lee Bennett.

Since the neonicotinoid ban, the industry has taken numerous alternative approaches to tackling CSFB and companion cropping is one of the mechanisms that could help mitigate the impact of the pest, says Lee. “But companion crops can be used for multiple purposes, not just pest management, and so a tailored approach to their use is required.”

RAGT's new Green Pack Duo, which provides a companion/cover crop blend along with a select OSR variety to suit specific farm requirements, will be available this autumn and aims to help target precise aims, from CSFB to soil conditioning, or N fixing, he explains. “For too long, the industry has made farms fit their variety, but the variety should fit the farm as the farm is the immovable object.

“We've previously seen co-mixtures of companion crops and OSR in the same bag but there can be issues with drilling both at the same time,” says Lee. “The companion crop can't always act as a mask or condition soils if it's emerging simultaneously with the OSR, so



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being able to plant the companion crop a week or two in advance of OSR will provide more benefits, such as physically masking or releasing volatiles before the OSR emerges.

“Having a more bespoke approach to companion cropping means they can work with your situation, sowing date, disease and weed prevalence and harvesting method.”

A further benefit is that the Sustainable Farming Incentive has an option available that companion crops qualify for, says Lee. “Growing a companion crop is paid at £55/ha and if you don't use any insecticide, this qualifies for £45/ha, so suddenly the practice is worth £100/ha.”



When nitrogen prices were high, semi-permanent covers, such as small leaf white clover, were being grown for their N-fixing ability.

becoming a weed.

“I used Fenugreek as a companion crop at a site in Lincolnshire, where it was planted two weeks prior to the OSR, and it established so well that it smothered the brassica completely. So caution is required because on rare occasions OSR can be outcompeted.”

A further consideration could be N-fixing ability, says Steve. “When prices were high, many were looking at semi-permanent covers, such as small leaf white clover. These can be undersown into oats or spring barley, but keep in mind clover is harder to drill OSR into and you have to get the density right, otherwise it’s too competitive with your cash crop.”

John likes to use purple vetch as it provides both soil structure and nitrogen fixation. It can also create cover in the gaps where pigeons could otherwise land.

One tactic to help prevent competition is to set OSR row widths to 25cm so that a companion crop can sit between the rows, he explains. “Also consider seed rate. For example, phacelia can be drilled anywhere from 0.5kg/ha to 2kg/ha and vetch can be planted at 3-5kg/ha, depending

on soil type and moisture.

“Alternatively, you could strip till — only cultivating where the OSR is going in and then put the companion crop alongside it, but I’d suggest working closely with your agronomist to determine what’s best for your situation.”

Steve advises keeping in mind that establishing OSR on heavy soils can be difficult and it’s equally hard to establish a companion crop, especially in a dry season when the companion might take moisture away from the OSR.

Best timing

“In this situation you could end up wasting more money by attempting to grow a companion. And if you’ve got a lot of straw debris, such as after winter barley, and the chaff hasn’t been spread well enough, this can kill the companion crop. So just keep this in mind,” he warns.

John has found the first half of August the best time to drill a companion crop. “This is generally the most successful slot, but the caveat is that there has to be moisture for seeds to germinate, so the timing is everything.”

Starter fertiliser is all part of the story with companion crops, says Steve. “As well as aiding ▶



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► the OSR, this will help kick start the companion crop too.”

Once a companion crop has been established, the next consideration is herbicide applications, says Steve. Graminicides can be applied to control volunteers or blackgrass without issue but when it comes to broadleaf weed herbicides, the timing has to coincide with the best time for removal of the

companion crop.

John highlights that although some species may be killed by cold weather, often this isn't the case. "Vetches aren't supposed to be able to tolerate the coldest weather, but they invariably do, but either Astrokerb (propyzamide+ aminopyralid) or Belkar (Arylex+ picloram) can be used to take them out. Leave

Regen companion

Companion cropping plays an integral part in OSR production at Overbury Enterprises and in farm manager, Jake Freestone's, regenerative approach.

Until 2013, the farming business had been operated conventionally, but undertaking a Nuffield Scholarship triggered Jake to focus on soil health. Working 1600ha for the estate's owners and 200ha on a contract farming agreement, Jake's regen journey has involved switching away from a horsepower hungry system, where ground was cultivated using a Väderstad TopDown, stale seedbeds were sprayed off, and then it was drilled using a cultivator drill.

Now, arable crops are direct drilled, rotations have widened, grass leys have been included and cover crops have become an essential tool. He grows more spring cereals and also plants short-term covers in the summer, while livestock has also been brought into the arable unit.

Jake's venture into companion cropping started after meeting farmer and consultant Andy Howard, who'd completed a Nuffield Scholarship on the practice. "OSR is a pretty good crop to have in the rotation from a regen perspective because of herbicide resistance and grassweed management, plus it spreads the workload at drilling and harvesting and is a good entry for wheat. And companion cropping has allowed us to keep growing it despite the neonicotinoid ban."

OSR is mostly drilled following winter barley, but sometimes after spring barley or winter wheat. Straw is chopped and spread, with stubbles left high to help mask emerging OSR from CSFB. OSR and the companion crop seed are direct drilled together in the

same row using a Cross Slot drill. "The Cross Slot has good downforce and slices through the straw, so we don't suffer with hair pinning," he says.

Drilling date has moved progressively earlier to get ahead of CSFB, and Jake now aims to get the crop sown on 4 or 5 August. "We apply liquid starter fertiliser and occasionally put poultry litter on ahead of drilling as we feel this may also mask the OSR."

Jake uses a companion crop mix of vetches, buckwheat and berseem clover, drilled at 7kg/ha, 3kg/ha and 2kg/ha, respectively, and costing £32/ha in total. "We used to plant buckwheat at 5kg/ha but it had a lot of biomass and proved too attractive to pheasants, so we dropped the quantity."

He likes the vetches and buckwheat because they're aggressive rooters — a week after planting vetch will be putting down 3cm roots and the buckwheat will already be attempting to put a leaf out. "The vetches, as legumes, are N-fixing, big rooters, are good for soil health and support mycorrhizal fungi. Buckwheat cycles phosphorous and makes it readily available for the OSR when it dies, whereas the berseem clover is similar to vetch, helping soil health with strong roots. A result has been that we've cut fertiliser application to OSR by 30kgN/ha."

A few years ago, a patch of OSR was accidentally planted without the companion crop mix. "We tissue tested the OSR with companion crops and the patch without and in the former, all micronutrients were in the normal range, but in the latter,

vetch in as long as possible — until January — and once destroyed it'll release N throughout the spring."

Buckwheat will die off in cold weather or in frosts and so doesn't have to be destroyed, he says. "Generally, by mid-November you'll see it start to keel over and it'll be gone by Christmas."

It's also possible to leave

companion crops and not destroy them, says Steve. "I have growers who've left vetch and phacelia and the OSR has performed just as well as when the companions have been taken out. But be warned, this looks horrendous and a bit scary, and is only really suitable in low broadleaf weed pressure situations." ■

there was a deficit," explains Jake. "So there's definitely something going on underground between the plants."

Previously, Jake grew 0.5kg/ha of phacelia in his companion crop mix, but found that herbicides weren't fully controlling it, so he has since removed it from the mix. "Other than this, the companion species have been easy to control, with the buckwheat dying off in frosts."

One of the savings from the system has been the removal of pre-emergence herbicides, which has saved £35/ha, says Jake. "We control the companion crops with a Astrokerb in December or January, and this helps with broadleaf weeds and blackgrass control as well."

"We've done soil mineral N and soil organic matter (SOM) testing to 15cm every year since 2014, and we've seen a 0.2% annual increase in SOM. So across the farm, our SOM has increased by 1.7% in seven years, which is really pleasing."

Jake feels there's been a bit of decline in OSR yields with the five-year rolling average at 3.5t/ha. "But we're not high yielding OSR territory and the lack of moisture in the previous springs hasn't helped."

Only hybrid OSR has been grown on the farm for the past two years, but Jake plans to try a blend of conventional varieties in the coming autumn to spread disease risks and broaden agronomic benefits. "We won't have to alter the companion cropping system at all, but as we don't use insecticides and haven't used fungicides for the past four/five years on OSR, we're aiming to get



Vetches, buckwheat and berseem clover are drilled at the same time as OSR at Overbury Enterprises.



A comparison of the companion crop at Overbury against an A4 sheet of paper to demonstrate size and biomass.

more mileage out of the system with a different blend of genetics."

He feels that companion cropping has contributed to the overall health of the farming system, has improved soils and supported the biology and diversity, but admits this can't be proven through replicated trials. "But I wouldn't contemplate growing OSR without companion crops now as it brings so many benefits to establishment and the system."



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