

# A different mindset

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## Technical Organic beans

Pea and bean crops must be grown without inputs if they’re to contribute to Ecological Focus Areas. CPM visits an organic arable farm in Suffolk to discover that doesn’t mean compromise and could have benefits if it’s taken across the entire rotation.

By Tom Allen-Stevens

John Pawsey stops for a moment as he strides through his bean crop and stoops down to inspect a severed blackgrass plant that’s been left on the surface between the 500mm wide rows.

“The hoe does a remarkably good job on the blackgrass — it cuts it off aggressively just below the surface, so it won’t grow back and won’t re-root,” he remarks.

Manufactured in Sweden, the 9m System Cameleon serves as both a seed drill and hoe. It’s a piece of kit that has enabled John to take the transition from “thinking like a conventional farmer to thinking like a true organic farmer”. At first, you’re not entirely sure whether he’s just saying that to come across as superior, but he explains:

“As a conventional farmer you have so many tools you can use, and you’re little more than an operator using them to keep your arable system simple. An organic farmer has to think out of the box. You’re not as constrained, but equally you have to be more creative and come up with your own solutions. Rather than keep things simple, the more diverse the better.”

### Absolutely integral

The winter bean crop is an absolutely integral part of the organic rotation John runs across the 1450ha he farms, half-owned and the rest farmed on contract, based at Shimpling Park Farm, near Bury St Edmunds, Suffolk. There’s a six-year rotation, two of which are fertility-building clover-rich leys. Following these come a mixture of ‘banker’ crops — the highest margin crops for which there’s a ready organic market — such as quinoa, spelt wheat and winter oats.

There are also spring oats and winter beans, with the latter in particular part of the rotation to maintain the fertility across the full six years. A spring wheat or spring barley, undersown with the grass/clover mix, completes the line-up. “We took the decision to convert to organic in 1999,” John recalls. “Wheat was languishing at £75/t. We wanted to keep farming, rather than get out or continue to diversify away from farming, but needed to add value.

“I was also slightly worried about the soils — for years we’d been paring back the fixed

costs, and I didn’t think it was doing the system any long-term good. Something needed to change.”

It was a neighbouring farmer who inspired him into organic agriculture. “It’s not until you see a well run system in which all the crops really look great and the figures stack up that you realise it might be for you. The only difference was that he had livestock, and I had no intention of bringing animals in.”

He’s since relented, and the sheep flock, that grazes half of the leys, are “doing incredibly well”. But it’s been one of a number of learning curves for John. “Things came to a head in 2012. I was growing winter wheat, barley and beans with a one-year clover-ley fallow, that was undersown into the barley. Blackgrass had built up, the Warrior wheat broke down to yellow rust, the beans were devastated by chocolate spot and the barley barely yielded. I realised I was still thinking like a



The hoe cuts off the blackgrass just below the surface, so it won’t grow back and won’t re-root.

conventional farmer — growing crops at all costs and just focused on the gross margin.”

He shifted his thinking to considering the rotation as a whole. “I’d been trying to keep things simple and that was a mistake. I realised I needed as much diversity in the system as possible.”

## Fertility-building

This brought to light the importance of the fertility-building elements of the rotation — previously regarded as fallow, the clover-rich leys became its powerhouse. “I realised how important it was to achieve a good establishment. The difficulty with undersowing into our Hanslope series clay here in Suffolk is that it sets like concrete. I’m spending £9000/year on small seeds. If that crop fails, it’s not only the cost of the seed that goes to waste — it has consequences for the next four years.”

It was social media that introduced John to the Cameleon system. A keen user of Twitter and YouTube, he regularly posts videos sharing his triumphs and failures and thrives on the feedback he receives. “Someone saw one of my videos and suggested I try the Cameleon. It’s a low disturbance drill with 36 coulters each individually mounted on a parallelogram with a press wheel, rather like a sugar beet drill. The difference is that it has a camera and also acts as a hoe.

It sets the depth incredibly well, and has quite an aggressive action. So on the final hoe on the spring barley, we undersow the grass and clover, pressing it into the lightly disturbed soil which gives it just enough moisture.”

The system has also opened his eyes to new ways with winter beans. “The bean yield is all over the place — we average about 3.2t/ha, with the best at 5t/ha and the worst



The bean crop is grown in 500mm wide rows to help with inter-row weeding and reduce pressure from chocolate spot.

at 0.5t/ha. When all you get is 0.5t/ha, that makes a real dent in the cashflow. The biggest limiting factor is chocolate spot, so I aim to do everything we can to stop the disease taking hold.

“If you look at volunteer beans, they get chocolate spot, but they still pod up as if the disease isn’t really bothering them. So it’s the microclimate, created by the close canopy, that really allows the disease to develop, and what I’ve been working on reducing.”

The first step in the system is variety. “We grow a blend of three varieties — Arthur, Clipper and Wizard. The idea of the blend is to cover yourself for any varietal weaknesses. We home save and have the seed tested every year.

“We’ve also tried a crop of Honey. This variety is shorter than the other three which allows us to weedsurf.” This is a 12m topper, ▶



John Pawsey finds that organic farming encourages him to think in different ways, and that’s where the new ideas come from.

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# Organic beans



The two hoe blades that travel between the crop rows are alternately angled to aggressively disturb all the soil between each row.

► mounted on the three-point linkage with guide wheels on the wing tips. It's taken above the crop late in the season to nip off weed heads, such as wild oats and charlock, that come above the crop.

"As for drilling date, I won't drill before 20 Oct because the beans will get too winter proud. Chocolate spot before Christmas is a real worry," continues John.

The beans are established with the Cameleon at a depth of just 75-100mm. "There is a balancing act here. We aim for a quick, even establishment and you need a decent plant stand to smother the weeds. But that'll induce a microclimate for chocolate spot. So we've been working towards allowing a more open canopy."

One option he's tried is to bi-crop with winter oats. "We sowed the oats on 20 Sept at 500mm row spacings. Then we came in a month later and inter-row drilled the beans. The idea is that the oats act as a barrier to stop chocolate spot developing, and

likewise the beans help protect as well as nurture the oats. You harvest both together and separate the grains with a cleaner."

## Following crop

But the oats dominated. "It was the best crop of oats we'd ever had, but the bean yield was poor. What's more, the following crop doesn't look good, and we've had to bring in some digestate to compensate. I think there's something that happens between oats and beans when you bi-crop them which means you lose the benefit of the beans as a rotational tool, and that's vital in an organic system."

So this year, there are no oats with the beans, but the 500mm rows have been kept. "I'm hoping this will encourage the crop to branch more — it's why we choose winter over spring beans in the first place. Within the rows the plant density has kept on top of



The crop shows signs of pea and bean weevil damage, but it's not yield-threatening. Bruchid damage means the crop can't be sold for human consumption.

weeds, but there should be enough of an open canopy so that chocolate spot doesn't take hold."

It's meant a minor modification on the Cameleon. The rows of beans are band sown to a width of about 60-70mm, at 500mm centres, which allows two hoe blades, offset at 250mm centres, to pass down between each row of crop. The blades themselves are alternately angled to aggressively disturb all the soil between each row, but leave the crop itself unscathed.

The more open canopy should encourage flowering and let the pollinators in, and John is hoping pod set will therefore also improve. One aspect it won't help, though, is bruchid

## Organic winter beans: how the finances stack up

	(/ha)
Home-saved seed, incl cleaning testing and royalty	£85
Weed control incl hand-roguing, weed-surfing, hoeing	£85
<b>Variable costs</b>	<b>£170</b>
Yield (t/ha)	3.2
Price (£/t)	£350*
Output	£1120
<b>Gross margin</b>	<b>£950</b>

Source: Shimpling Park Farm; \*typical price for organic feed beans; Note: costs do not include net cost of the clover-rich ley, which is spread over the rotation

## There's more than one way to get the EFA

Those planning to count pulse crops as their Ecological Focus Area may not apply agrochemicals to that crop, and the area must be multiplied by a factor of 0.7 to calculate the EFA contribution, according to current Basic Payment Scheme rules. But there may be better ways to use pulse crops to help towards the EFA, suggests PGRO's Roger Vickers.

"I can't believe that people would grow pulses simply to tick a box on a form — agronomically they have so much more to offer," he notes.

"What John Pawsey's system has shown is that it is a crop that can bring a decent return without the use of chemical inputs. There's a lot a conventional grower can learn from an organic system for those prepared to put in the management attention. But it's not a system you can simply dip in and out of, and John has had his disaster years. Most growers aim to minimise the use of agchems anyway, but at

least like to have the option to use them.

"What is clear from John's system, though, is the contribution his bean crop makes to building fertility and improving the soil across the rotation, and that's something any grower can benefit from, whether or not you're using agchems."

He points out that pulse crops have a different growing window from other crops in the rotation, so can be used in conjunction with a catch or cover crop to contribute to the EFA.

"For example, a catch crop must be in place between Aug and Oct, so could be established after a cereal harvest, then the area planted with a conventional winter bean crop — that fits with the ideal time of year to establish a crop," suggests Roger.

"Alternatively you could grow a conventional crop of peas after an EFA cover crop. They would be harvested in time to establish an EFA catch crop that could then be followed by a



Any grower can benefit from the fertility and soil improvement benefits pulses offer to the rotation, regardless of whether they use agchems, points out Roger Vickers.

late-drilled winter wheat. That would deliver two years' EFA requirement and bring in all the rotational benefits a pulse crop has to offer."

## Farm facts

*Shimpling Park Farm, nr Bury St Edmunds, Suffolk*

- **Farmed area:** 1450ha
- **Cropping:** Clover-rich grass leys; Winter wheat (some heritage varieties); spelt wheat; winter beans; winter oats; spring barley; spring oats; quinoa
- **Livestock:** 650-ewe NZ Romneys
- **Soils:** Hanslope series clay loam
- **Mainline tractors:** Case IH Quadtrac 450; Puma 185; John Deere 6170R
- **Combines:** Claas Lexion 750 TT with 9m header
- **Seeder/hoe:** 9m System Cameleon with up to 36 coulters/blades
- **Weeding:** 2x 8.8 CTM Weedsurfer; 9m Einböck tine weeder
- **Loader:** JCB 530/70
- **Ploughs:** 2x 6f Dowdeswell
- **Cultivation:** 5m Gregoire Besson Discordon; 9m Väderstad Carrier; 9m Dalbo Cultimax
- **Staff:** Two full time plus John plus seasonal workers and weed-roguing team

beetle. "There's not much you can do about bruchid beetle in an organic crop, and it rarely makes the grade for human consumption as a result."

The crop is highly valued as an organic feed source, however, and John sells his to British Quality Pigs, that are sold under the premium Duchy Original brand. The crop currently receives a healthy £320-380/t price.

As an organic crop, the only costs are weed control, but John cautions that it can be misleading to take any single organic crop and consider it outside the context of a rotation. "There are years in that rotation with no output, so you always have to consider it as a whole. What a straight gross margin also ignores is the benefit the beans bring to the rotation."

Which raises the question of what conventional growers can learn from organic farming — what future is there for a fusion of organic with conventional, such as Conservation or Regenerative Agriculture? "Conservation Agriculture stole all our methods and made a system that's more accessible," says John with a wry smile.

"It's true that organic farming has failed to capture farmers in quite the same way, but



*The System Cameleon is used to undersow the grass/clover leys as well as perform inter-row weeding and establish crops as a conventional drill.*

Conservation Agriculture still has its get outs, such as ammonium nitrate, triple super phosphate and glyphosate — you're still in the mindset of the conventional farmer.

"That means you're still just an operator within a system someone else is managing. You'll spend an awful lot of time operating within a fungicide control programme, for example. I wouldn't say I spend any less time obsessing about my crops and worrying about disease I know I can't do anything about. But that encourages me to think in different ways, and that's where the new ideas come from." ■

## New control for number one bean pest

Following last year's widespread downgrading of field beans due to bruchid beetle damage, the new authorisation of insecticide Biscaya (thiacloprid) for its control is timely.

Frontier Agriculture's UK pulse manager Andy Bury has observed an increase in bruchid beetle problems over the past five years and says that 2017 was particularly challenging. The UK crop of spring and winter beans ranges from 550-650,000 tonnes and typically there's an export market for good human consumption beans of around 280,000 tonnes, he says.

"Last year UK exports wouldn't have reached 100,000 tonnes and bruchid beetle was responsible for 80% of the downgrading. After colour it's the main reason beans fail human consumption."

Frontier's quality control test for beans involves cutting open 50 seeds to assess for damage. The specifications for Egypt, which is the main export market for human consumption, are a maximum 5% of seeds with internal bruchid still present and a maximum of 5% seeds that are broken/damaged by beetle exit. Frontier can manage up to 10% total damage but beyond that the human consumption premium, typically £20/t, is outweighed by allowances.

When it comes to control, Andy stresses that

it's all about timing. "Based upon the simple criteria of pods being present on the lowest node and the temperature having reached 20°C on two consecutive days, beans are at risk from bruchid beetle attack, so you have to move fast. Once you see yellow eggs on the bottom pods it's too late."

PGRO principal technical officer Becky Howard concurs and explains that insecticides target the adults, not the larvae, so reduction of damage must be achieved by reducing egg-laying. Winter beans generally start setting pods in late May and most eggs are laid in the first two weeks before they move on to spring crops during June.

"It was last year's above average temperatures during the damage susceptible period that made it such a bad year for bruchid beetle damage," she explains. "The heat made bruchids very active and at the same time reduced the persistence of pyrethroid sprays."

The new option of Biscaya ought to be more persistent, she says, and is a welcome introduction with on-label approval for use in field beans for the control of bruchid beetle and pea aphids.

For the reduction of bruchid beetle damage applications must be made between 1st May and 31st July. The label advises that most



*The damage caused by Bruchid beetle can cause problems where beans are grown for the human consumption export market.*

reliable results will be obtained from application of 0.4 l/ha when temperatures reach 20°C or more on two consecutive days at early pod set. The second of the two applications permitted per crop should go on a minimum of 10 days later.

Becky adds that bruchid beetle has been difficult to control because it's quite mobile and concentrated lower down the bean plant. "It can be difficult to reach so don't drop water volumes too low, 200 l/ha is ideal. It helps to use angled nozzles to penetrate the canopy and get the spray down to the target."