Beans bring rotational benefits

While blackgrass is the driver for most decisions, it’s the effect beans are having on the following wheat crop that’s caught the attention of one Northants farming business. CPM pays them a visit.

By Tom Allen-Stevens

Every now and then, Ian Matts stoops down, plucks a flag leaf and pops it in a plastic bag. We’re wandering through a ‘zero-N’ plot in one of Brixworth Farming’s fields of Revelation winter wheat, and the samples will tell him how much nitrogen is in this part of the crop, compared with the rest of the field. But if it wasn’t for the thin white poles denoting the area, you’d barely tell the difference.

“Last year this field was in beans, and next door we have the same first wheat after oilseed rape, with a similar ‘zero-N’ plot,” he explains. “It’s part of a PGRO project to ascertain just how much of a nutritional benefit beans bring to the following crop. At this time of year, you really begin to see the difference between the plots that haven’t had any applied nitrogen.”

The farming business covers 2000ha of arable crops — a joint venture of five farms based at Brixworth in Northants. Ian Matts is responsible for the agronomy across the arable crops, a job he balances with his role as company agronomist for Yara UK.

You’d think then, he’d have a vested interest in plying the crops with as much fertiliser as they’d take, but far from it — it’s clear as he criss-crosses the crop he’s intrigued at how this high-performing wheat variety appears to be thriving, on relatively little applied sustenance.

Lovely dark green

“Across the rest of field, we’ve applied 160kgN/ha, while we’d normally put 220kgN/ha on a first wheat. There’s 4.5% leaf N in the flag and it’s a lovely dark green — there’s every indication it’ll yield at least as well as a crop that’s received a full dressing.”

The move to grow more beans hasn’t been a philanthropic yearning to cut inputs, however. “Historically, OSR has been the main break crop and a small proportion of the arable area was in a wheat/OSR rotation,” recalls Ian Matts. “We’ve looked at alternatives, but beans are the only viable option.”

With mainly heavy, Denchworth and Hanslope series clays, as well as some lighter ironstone soils, blackgrass is a major problem for the business and lies behind many of the agronomic and crop management decisions. “We’ve had samples tested for herbicide resistance and know we have problems. We’re trying a number of different techniques to stay in control and continue to look for new ideas,” he says.

“Beans aren’t fantastic against blackgrass, but they do allow us to implement practices across the rotation that can help.”

Winter and spring beans: how the finances stack up

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Note: Figures based on Harvest 2014 results at Brixworth
For many years, there’s been a strong association between Charles Jackson and Co, based at Long Buckby, Northants, and the Brixworth Farming Company. CJC began trading as an agricultural grain store in 1985 and has expanded as an agri-business over the past 25 years. It now offers processing and marketing to growers, with 40,000t of on-site storage and a staff of 30 people.

The company stores, processes and markets Brixworth’s bean crop. “The main market we aim for is for human consumption, to North Africa, mainly Egypt,” explains Chris Jackson. “The premium this year has been phenomenally high, mainly because the quality of the French crop, the UK’s main competitor, has been poor.”

While a shiny pale sample, free of bruchid-beetle damage, is essential for human consumption, underpinning the sector is the feed market. Here beans compete with soya or other proteins, but he doesn’t think growers should be worried at a potential 30% rise in the UK bean crop expected to come onto the market this year. “Feed beans trade at around £30/t above wheat. As long as the price is right, feed compounders will absorb as much beans as growers want to make available — having a strong plentiful home-grown supply will probably be a good thing for the sector.”

Another market for feed beans is for fish farmers. “It’s used as a binder, mainly in salmon farming, with those in Scotland an important outlet, while the bigger demand comes from Norway.” The product has to be supplied without the hull, that’s high in tannins, so the bean crop destined for these markets is processed at CJC before it’s shipped north. “It’s not a premium market for the grower, but it does offer a secure outlet for those who trade their beans with us,” notes Chris Jackson.

Those growing or considering a move into beans should aim for the premium market, he advises, choosing pale hilum varieties. “If growing more than one variety, keep them separate on farm, and take care at harvest as if they’re too wet and dried too quick, that can spoil the colour.”

Now beans slot in roughly one year in every four. “It’s not quite 25% of the area, and it’s split between a winter and spring crop. Blackgrass will decide which of these we choose for a particular field, as we’re achieving good yields and an impressive gross margin with both winter and spring beans,” explains Ian Matts (see table on p58).

A 6f plough has been re-introduced across the farm on some of the worst blackgrass fields ahead of some of the bean crop — 150ha was ploughed shortly after harvest last year. “It’s the first time we’ve ploughed for many years, and done some comparisons here and there to see how it works. At first it looked very clean, but then you get some blackgrass that emerges from depth. I’m still undecided as to how effective it is,” he says.

The winter beans were drilled with a Horsch 8m Sprinter towards the end of Oct, once the winter wheat was drilled up. “We tried to spray off as many green flushes as we could and intended to apply a further dose of glyphosate after drilling and before the crop emerged. The problem is, the beans emerged too soon. It’s a tactic that...”

Sampling of flag leaves from the wheat crop reveals the contribution the previous bean crop has made.
Ian Matts is responsible for the agronomy across the arable crops at Brixworth.

You’re very reliant on the pre-emergence herbicide. In 2013, this gave us very good control, but it didn’t work quite so well last year.

Wizard is the variety established in the winter, chosen because it has a pale hilum making it suitable for human consumption. “We’ve raised the seed rate from 18 seeds/m² in 2013 to around 24 seeds/m² last year. Wizard wants to be drilled at a slightly higher rate than others.

“We considered a phosphate seed dressing — beans like a lot of P. But generally the farm indices are good — in the 1-3 range, aiming for 1+ — and we apply some phosphate in season to OSR and wheat. As long as we maintain a good soil structure and organic matter, the beans shouldn’t go short of P.”

Basagran (bentazone) is applied post-emergence, which offers good control of charlock, but in-season graminicide choice is limited in beans, he notes. “It’s a very open crop, and blackgrass comes through again in spring. We use Aramo (tepraloxydim) but that doesn’t offer great control. One option we’re considering is to try some inter-row spraying.”

Bruchid beetle is the main pest to keep in check in winter beans, although the crop was also sprayed for pea and bean weevil this season. “We use the BruchidCast service, but look to spray as soon as the temperature threshold is reached, aiming to

Resistant weevil found in UK crops

Pea and bean weevil resistant to pyrethroids have been found in samples collected from crops in Herts, Lincs, Northants, Notts and Warwicks. Adult weevils resistant to a representative pyrethroid were identified by Dr Steve Foster at Rothamsted Research as part of a four-year industry-funded research project investigating “lure-and-kill” technology to manage beetle pests.

“Peas and beans are past the period of greatest risk this year,” notes Becky Ward of PGRO. “But bean growers should be aware that they may find pyrethroids are not effective against pea and bean weevil when they establish their crops next year.

“We’re looking for alternatives and hoping to get off-label approvals for other products in place before the 2016 crop is drilled.”

For now, bruchid beetle will be the main concern. “Crops should be sprayed when the maximum daily temperature has reached at least 20°C for two consecutive days and when crops have set first pods,” she advises. Local bruchid spray forecasts are available through Syngenta’s BruchidCast service, she adds.

Disease levels have been low, but growers should be on the look-out for downy mildew in spring bean crops, while chocolate spot will be beginning to show in winter and spring varieties. “If the weather turns unsettled, growers will need to stay on top of these diseases. Hot days and cool, humid nights will bring on rust, and that’s a high risk towards the end of June and into July.”

Pea growers should be monitoring for pea moth using traps, with the threshold for combining peas at 10 moths found in either trap on two consecutive occasions. “The spray date is dependent on the temperature and can be 10-20 days after thresholds are reached in traps. A second spray should be applied 10-14 days after the first,” she advises. Pea-moth spray forecasts can be found at www.pgro.org.

Mild and wet conditions will bring on sclerotinia, botrytis and leaf and pod spot, she adds.
combine this with a fungicide application.” Late in the season, Ian Matts keeps a check on black bean aphid and will spray if it poses a serious threat.

“Disease control revolves around chocolate spot, he says. “Signum (boscalid+ pyraclostrobin) is a good all-rounder against it. We made three applications last year, but generally aim for two. Rust can come in later on and we’ve found Alto Elite (chlorothalonil+ cyproconazole) with or without Amistar (azoxystrobin) works well.”

“Resistim, a phosphite-based stimulant, is added to the fungicide around flowering, which offers good activity on downy mildew, he says.

Close to the ground

“Harvest of the winter crop generally follows straight after the wheat. We’ll desiccate with Reglone (diquat) as we found last season that we had more pod shatter with glyphosate. You have to be careful combining them as some of the pods in a winter crop hang close to the ground — that’s when you regret any lumpy soil or stones you may’ve left on the surface.”

This year, the spring bean crop was drilled with an 8m Väderstad Rapid drill. “You can’t go on calendar dates with spring beans — we learnt that to our cost two years ago when we drilled half the crop early. The rest wasn’t established until April, that I thought would be too late, but it was the better crop. So you have to be governed by the soil conditions.”

“Fuego has been dropped in favour of Fanfare and Vertigo grown this year, drilled at 45 seeds/m². ‘The seed cost is quite high for the spring crop,’ he notes. A pre-em application of Lingo (clomazone+ linuron) is made soon after drilling, but Nirvana (imazamox+ pendimethalin) is applied to headlands as there’s a 10m buffer-zone restriction on Lingo. In addition, a pre-em dose of glyphosate is applied “as late as we dare”.

“This year the crop was hammered by pea and bean weevil and we sprayed twice with Afrisect (cypermethrin) for the pest. We also applied Basagran post-emergence for broadleaf weeds — that’s always a tough call with spring beans, but you’re never thanked if you leave it out and the crop is full of weeds at harvest.”

“Downy mildew is the main threat, and the crop will generally receive a dose of Signum followed by Alto Elite, with Resistim added at flowering. Harvest of the crop generally follows on from winter beans.

“The main quality concern is bruchid beetle, and you don’t want to leave the crop out too long and risk staining the seed, either. The human consumption premium is worth it to keep the crop in good condition. But it’s taken off farm at harvest and stored with Charles Jackson (see panel on p59),” notes Ian Matts.

“Blackgrass is the main driver behind how he manages the crop, however. Cover crops are being trialled on the farm alongside other practices designed to maximise the potential of the bean crop to help keep the weed under control.

“Nevertheless, yielding between 4.5-5t/ha, both spring and winter beans are producing a healthy return in their own right and proving to be excellent entries for wheat, says Ian Matts. “You can drill straight away after beans, or just give the ground a light cultivation — the crop leaves the field in ideal conditions. And they do seem to benefit the following crop. Blackgrass control may still be a work in progress, but beans have definitely earned their place in the rotation.”

**Farm facts**

Brixworth Farming Company, Creaton, Northants

- **Area farmed:** 2000ha
- **Staff:** two full-time, four part-time directors/shareholders plus Ian Matts and harvest staff
- **Soil type:** Mainly heavy, Denchworth and Hanslope series clays with some lighter ironstone soils
- **Cropping:** Winter wheat (Skyfall, Revelation, Myriad, Target, Belepi, Mulika), winter oilseed rape (DK Extrovert, Popular, DK Expower), winter beans (Wizard), spring beans (Vertigo, Fanfare)
- **Mainline Tractors:** Challenger MT 875, MT 865; John Deere 6190R, 6930
- **Combine harvester:** 2x Claas Lexion 780
- **Sprayer:** 2x Bateman RB35 with 32m boom and 4000-litre tank
- **Drill:** 8m Horsch Sprinter; 8m Väderstad Rapid
- **Cultivation:** 6m Sumo Trio, 6.5m Simba Solo, Väderstad Rexius Twin Press, 6f Dowdeswell plough, 6f Greigore Besson plough, 20-year old Combi drill
- **Spreaders:** 3t Kuhn Axis 40.1, 3t KRM Bredal