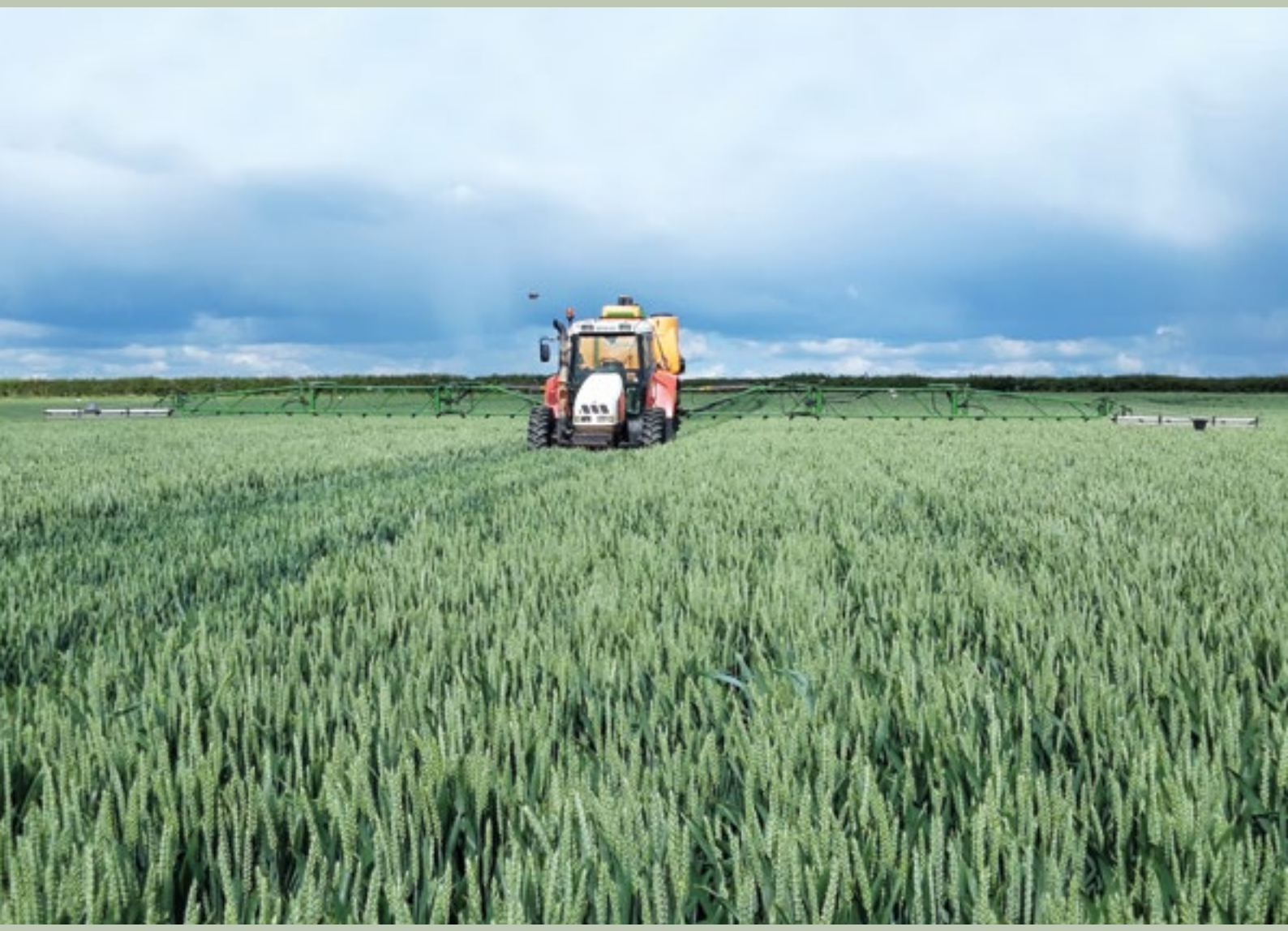
Springfield Farms



Farm Diary 2018/19

Welcome to the third edition of the Springfield Farm Diary.

After uninspiring yields, and rising input costs, Martin Lole converted the plough and press based farm to strip tillage in 2010 and hasn't looked back since. Thanks to reduced cultivations the heavy Evesham Lias Clay farm is thriving, soil health and structure have improved and are consistently supporting higher yields with previously high weed pressure a thing of the past. Establishment costs more than halved in the first year and the innovative Mzuri one pass system has kept costs down ever since.

Now in its ninth-year plough-free Springfield Farm continues to be a hub for sharing and trialling new ideas. With a passion for fine tuning the system, the farm is home to numerous trials and experiments aimed to push our knowledge and challenge our way of thinking. Our deep-rooted love of nurturing and preserving the natural environment means the farm aims to operate sympathetically to its environment whilst still producing viable and sustainable commercial crops.

A message from the Farm Manager

The 2018/19 growing season at Springfield Farm has certainly proven to have been another memorable one! The weather continued the theme of rainfall well below average emphasised the need for adaptable, healthy soils supported by excellent rooting – luckily something we have built up on the farm since its conversion to strip tillage in 2010.

This year, the farm has been fortunate to welcome visitors from around the globe which has provided fantastic opportunities to share ideas and gain understanding of crop production in different climates.

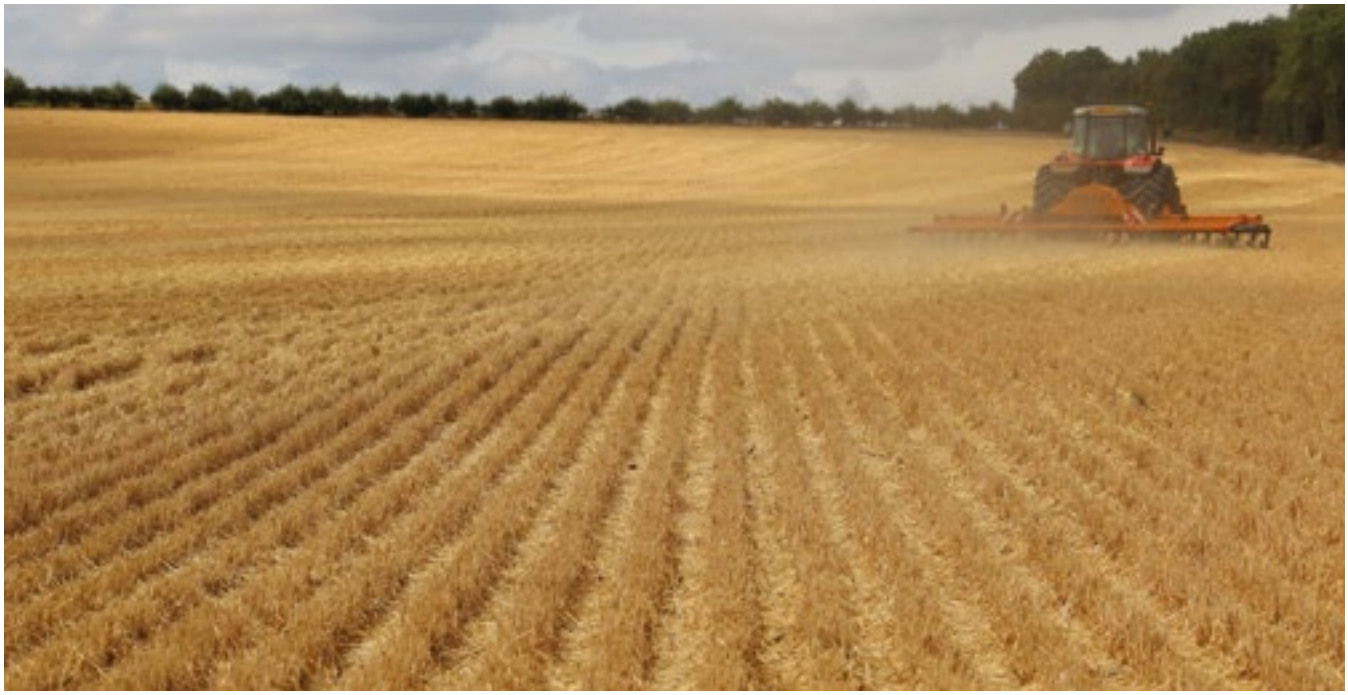
We've also hosted a wide array of trials, ranging from comparing hybrid and conventional seed breeding, seed rates, sowing dates, cover crop destruction and many more. These went on to deliver fascinating results into readily applicable aspects of arable crop production which, when coupled with our Mzuri strip till system, supports healthy soils that crops need to thrive.

We've had an interesting year and I hope you enjoy reading the 2018/2019 print edition of our diary. I look forward to sharing our experiences in the future as we seek to build resilience in our farming system through strip tillage.

Ben Knight
Farm Manager

August Crop Update

14th September 2018



Raking Wheat stubbles with the Mzuri Rezult Rake to encourage weeds and volunteers to chit

Soya aside, this year's harvest was over and done with in record time, leaving us with plenty of time to crack on with Autumn drilling – rainfall pending.

In, dare I say it, a normal year we would have fantastic moisture by this point ready to drill into following harvest; however, this year was a very different story. Large open cracks and very dry topsoil to a significant depth meant we were left practicing our rain dance. By now, I would say I'm quite the expert.

More productively perhaps, I took the opportunity to get the Rezult straw rake out and raked the Wheat stubbles in anticipation of rain. A favourite operation of mine, the rake evens out chopped residue ahead of drilling whilst creating a tilth to mix weed seed and soil to promote a good chit. Eventually, through luck or bad dancing, we were granted with rain just in time for our cover crops which we began drilling on the 7th of August.

Cover crops going into Wheat stubble

The first to be drilled was a homemade mixture from the remnants of the previous year's unused seed, which included Rye, Vetches, Radish, Linseed and Clover. With variety being the spice of life, I thought 'why not' as I poured the array of seeds into the Pro-Til's tank. Using the double shoot coulter on 33cm row spacings I drilled the crop mix along with 125kg/ha of DAP down the front leg, just below the seeding zone where it was needed.

A calibration later and we moved straight into sowing our typical radish mix at 8kg/ha. This tailored mix consists of two types of tillage Radish and two types of fodder Radish, enabling us to very effectively capture sunlight and build biomass above and below ground. The blend comprised of 20% Daikon tillage Radish, 20% Structurator tillage Radish, 30% Iris fodder Radish and 30% Brutus fodder Radish.

Our experiment grazing mix

Our final cover crop is a new idea we're trialling for the first time. We drilled Oats into Oilseed rape stubble with the intention of retaining volunteers to create a late autumn grazeable mixture. Again, using the trusty Pro-Til, I drilled the Oats at 40kg/ha with DAP applied at 120kg/ha.

Drilling Oilseed Rape with our new Mzuri drill

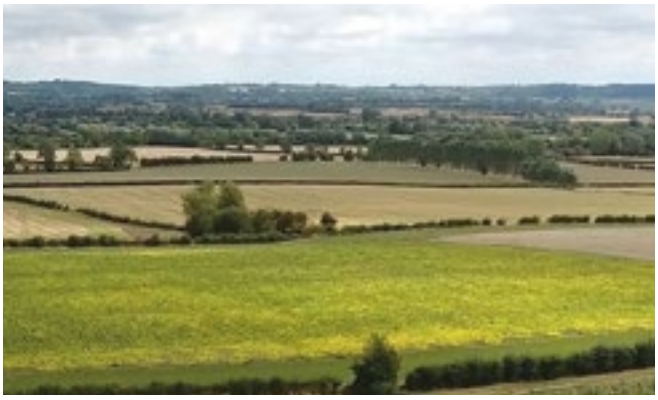
This year we took delivery of our new all singing, all dancing Mzuri Pro-Til 3T which was kitted out with all of the latest developments including, for the first time on this farm, a slug pelleter and an Avadex applicator. Like all boys and their toys, it was put to work immediately to establish the Oilseed Rape into Wheat stubbles. We've come to prefer the 66cm wide row spacing for growing Rape, which on our 3 metre Select drill engages five of the nine coulters. Conditions were ideal after having previously Rezult straw raked and sprayed off any volunteers and weeds which created an excellent stale seedbed.

Following recent rain and having set up baiting points, we were seeing the return of slugs to the surface. The Stocks TurboJet air assisted applicator allows us to distribute slug bait through the coulter to join the seed in the seeding zone exactly where it's needed. This targeted approach means we are achieving maximum effectiveness from each pellet applied; precise application also means we are reducing the risk of Metaldehyde finding its way into watercourses, a real risk when broadcasting.

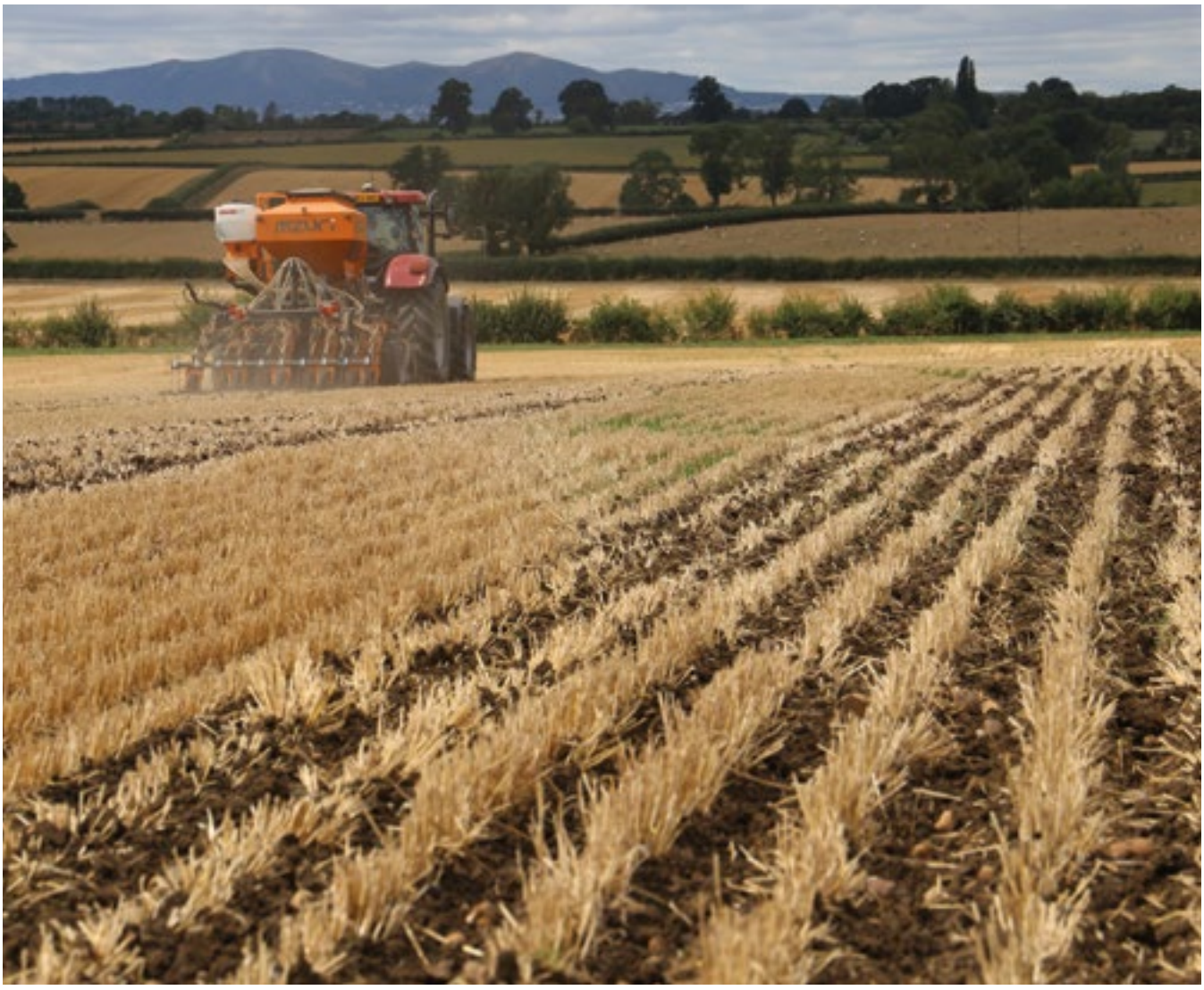
After drilling, all of the OSR was rolled. This isn't something we normally do as we typically find we achieve good levels of consolidation behind the press wheel, but with slugs rearing their unwelcome heads, we felt it best to really impede their movement further. I have to say, it's a job I enjoy doing and with the Mzuri system I have the time to spare to do it!

Soya

During the second week of August following the eventual rain, I noticed a number of broadleaf weeds emerging in the crop, which had up until that point remained relatively clean. This perhaps gives cause to desiccate after all and is something that will be taken into consideration when the time comes. Apart from this the crop looked well throughout August as the pods filled up during the beginning of the month and the crop was starting to senesce by the end.



Taken on the 22nd of August, from above the Soya is starting to senesce



The new Pro-Til - The second stocks tank was fitted later which enables us to apply Avadex as well as slug pellets, fertiliser and seed. The real one pass machine!

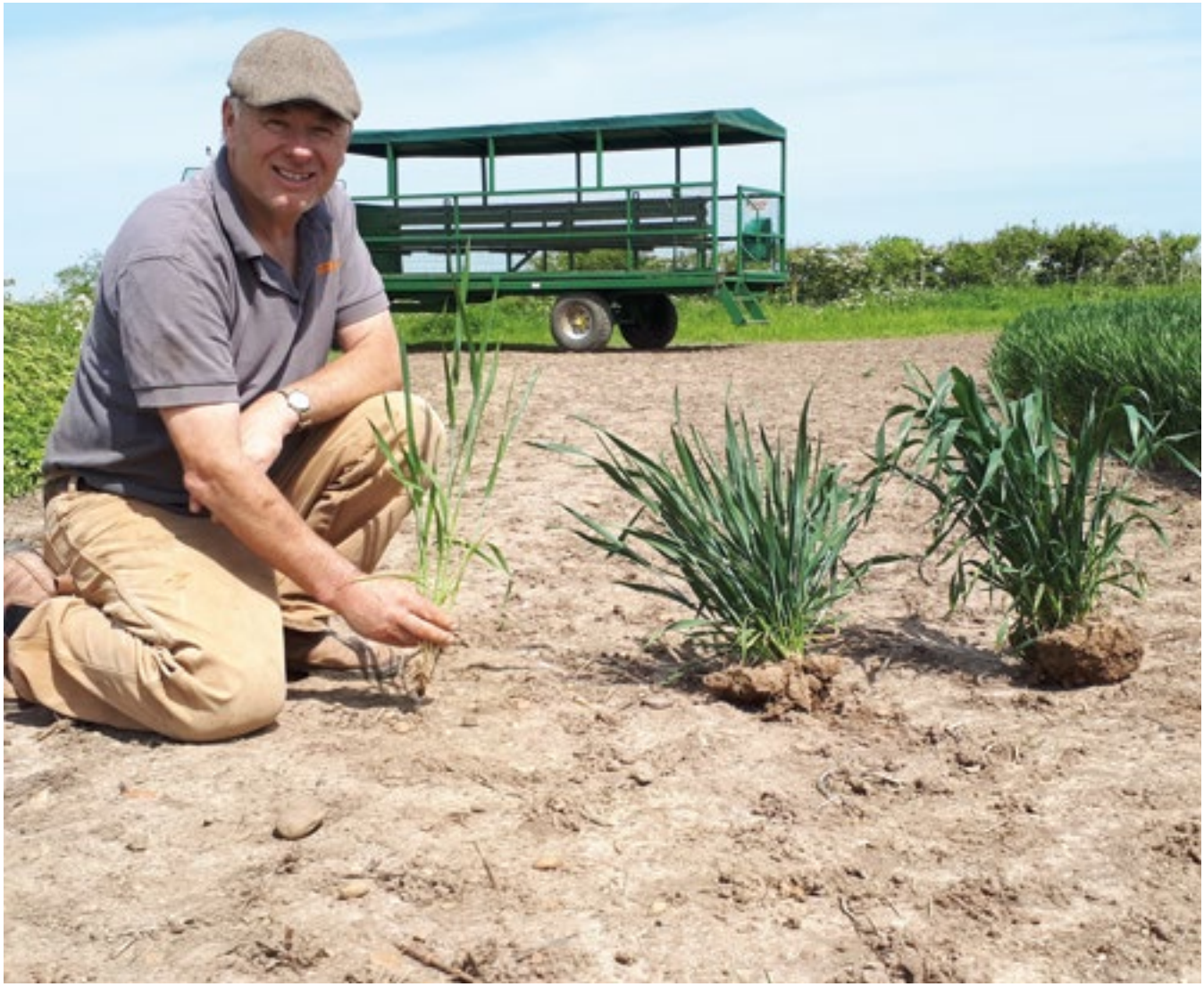
Continuing the low seed rate theme – Wheat

25th September 2018

Last year, many of you may recall that we rather ambitiously drilled two fields of Wheat at a reduced seed rate of 18kg/ha, one being the hybrid Hyclick and the other a conventional variety, Graham. Our aim was to see how a lower seed rate would impact the crop and what impact this would have on yield.

After Christmas, with a less than inspiring looking crop we thought we'd been a bit too ambitious with our plans. However, come spring, the crop rocketed away and far outdid our expectations. The extra space around each plant created by a lower population had increased light interception and promoted strong, healthy growth. Tiller numbers were something else altogether and were averaging in the 30's for both hybrid and conventional varieties. Come harvest, the hybrid just pipped the conventional Wheat variety to the post with a yield of 6.5t/ha verses a respectable 5.8t/ha. Given the difficult year and at a seed rate of just a tenth of our typical rate, we are all incredibly thrilled with the results. The testing year brought Wheat yields down across the farm by 20-30% which made the yields of the low seed rate trials even more impressive.

Bitten by the low seed rate bug, we have decided to drill more reduced seed rate trials going forward into this year. On the 19th of September, we drilled three 1ha plots of Costello at 160, 240 and 320 seeds/m^2 and continuing the hybrid theme, we plan to mirror these plots in three weeks' time with the hybrid variety, Hyclick. The range of seeds per square metre were chosen to identify a seed rate that was low enough to benefit from increased light interception but not too low as to produce unviable crops. We will be following these trials throughout the season and be sharing them in future farm diary entries. Watch this space, literally!



Last years low seed rate trials, Left: Graham drilled at 180kg/ha, Middle: Graham drilled at 18kg/ha, Right: Hyclick drilled at 18kg/ha.

September Crop Update

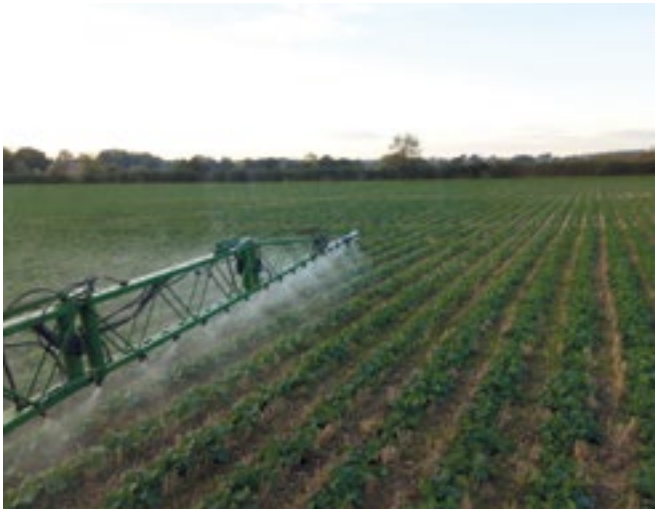
12th October 2018

After spending an excellent day in the sunshine at Moreton in Marsh show I thought I'd cap it off with an early evening check of our OSR crop. Having only seen the odd 'shot hole' up to this point I hadn't anticipated seeing flea beetle at every turn upon my arrival. With that, my evening walk had turned into an evening of spraying.

The decision to spray Pyrethroids is not something we take very lightly here what with the impact they can have on our beneficial insects. But given the seriousness of the situation and mitigating the risk by spraying at night, I felt the decision necessary and one well made to save the crop.

Looking at another challenge that has faced the farm, this has certainly been a year where moisture has been a precious commodity and where the Mzuri one-pass system has excelled itself. Through its immediate reconsolidation, minimal moisture is lost to the atmosphere and retained where it's needed for quick and even establishment. Our Oilseed Rape has clearly benefited from this and when compared to multiple pass systems in the local area is visually stronger and more forward.

The best 'tonic' though has been rainfall which, by the time it arrived, was well overdue. Using our 'time lapse' camera the growth within a 24hr time frame post rainfall was considerable and goes to show the impact that moisture really can have on growth. Thank goodness we hadn't lost what was retained in the soil by heavy cultivations pre-drilling.

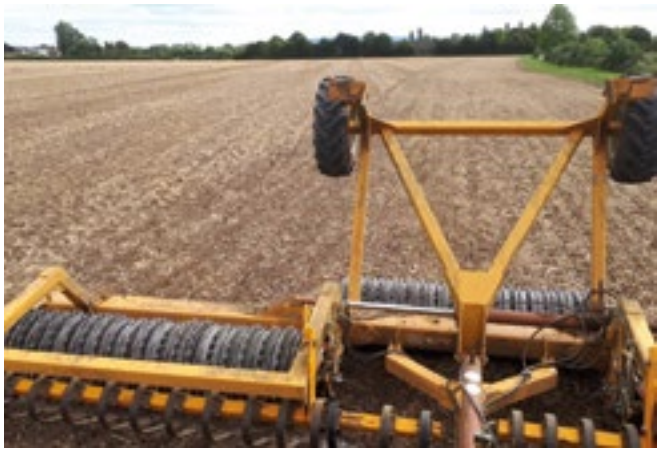


Our OSR receiving an insecticide on 26th September, drilled on 66cm row spacing

Late drilled cover crop for Blackgrass control

After achieving two flushes of Blackgrass using the Mzuri Rezult rake I sprayed the field off ahead of sowing on the 5th of September. Sowing a cover crop this late isn't something we would normally do, but as part of a strategy to get back on top of Blackgrass that had gotten away, we were prepared to accept a lower biomass crop.

The mixture was something of a concoction, sown at 10kg/ha and included Radish, Oats, Phacelia and Linseed. With a good blend of species and rooting structures I felt this recipe was on the right track to actively benefit the soil and improve structure, whilst keeping the Blackgrass seeds on the surface. The plan is to hopefully achieve another chit before next spring and clean the field up further in time for spring drilling.



Rolling in the last of the Autumn cover crops

Winter Wheat

Unusually for Springfield farm our Wheat drilling campaign began in September, it was however, only 3ha's of a plot as part of our trial field. Each Autumn we welcome to the farm a large group of German farmers in conjunction with Mzuri and their Polish colleagues. The pressure was on to get a Wheat crop in and up in row, in time for their visit.

Seeded with Costello the three hectares were split into three plots, each sown at a different rate. One at the 320seeds per m^2, the standard farm rate, the second at 240s/m^2 and the third at 160s/m^2. Interestingly, our German visitors were most familiar with the 160s/m^2 rate as they favour a lower plant count, giving stronger individual plants that are better able to withstand their harsh winters. They viewed the 320s/m^2 plot as 'far too thick' which is probably a fair observation given the sowing date. I'm pleased that their view supports our idea of lower sowing rates promoting greater tillering, stronger plants and improved yield potential.

Starting the Wheat drilling campaign with seedrate trials

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Cover crops coming along nicely

5th October 2018

This year we've tried to broaden our cover crops across the farm and have included two additional mixes to the rotation. We've drilled Oats directly into stubble for an Oats and volunteer Oilseed Rape mixture which we hope to be able to graze and a Rye, Vetches, Radish, Linseed and Clover mix.

Drilled with our Mzuri Pro-Til between the rows of standing straw, all of our mixtures have established quickly and have started to get away well. Our aim is to produce a mass of green cover to harvest sunlight, provide biomass and improve soil structure through rooting.

With greater species diversity at its heart, I hope the new mixtures will improve biodiversity and send different types of roots with varying characteristics down at different depths. After all, roots are our greatest tool!

Snapped in Early September the cover crops are getting away well

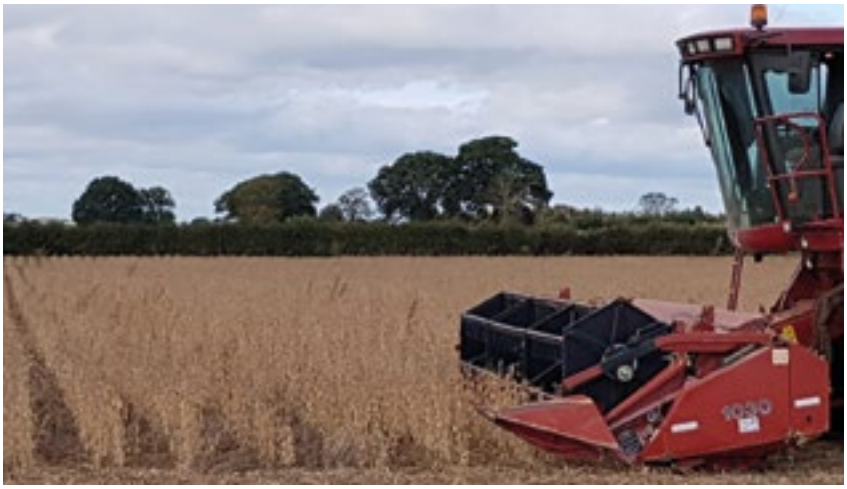
The same cover crop taken a month later

October Crop Update

1st November 2018

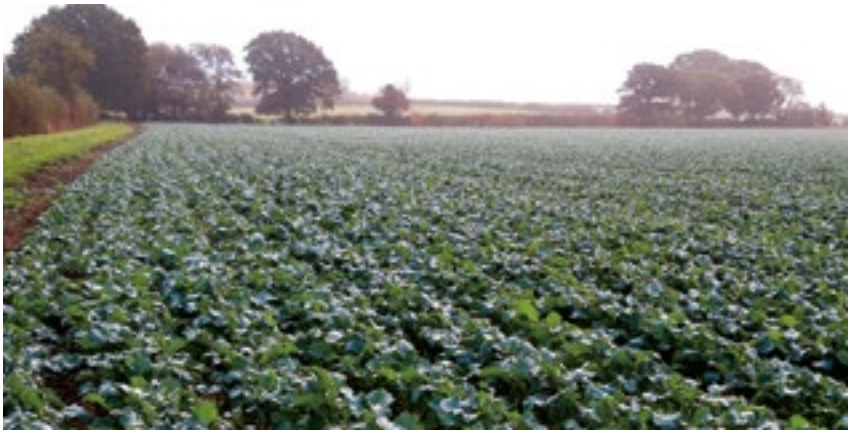
Soya Harvest

Kicking off October we started with the Soya harvest. When it came to the weighbridge the lack of rainfall from Spring drilling to the end of July was noticeable. With yields down, I reminded myself that this is still only our second year growing the crop and it remains relatively new to us. Throughout the growing season it's been easy to keep and low maintenance, providing that is, you can get it over the initial period of Pigeon-Armageddon - they really do take a fond liking to Soya and if gone unnoticed it can prove catastrophic to establishment.



Oilseed Rape

Both the conventional variety Campus and the hybrid DK Expedient have really moved on since last month and I'm pleased with all of the fields going into November. The majority of the farm OSR was drilled on 66cm row spacing and come mid-October the plant rows were touching and looking impressive. With this in mind I was out with the sprayer applying Metcostar as a PGR to ensure the crop didn't get too ahead of itself this side of winter. As I looked around whilst spraying I smiled and thought to myself, why would anyone want to establish Rape any other way?



The hybrid, DK Expedient drilled on 66cm row spacing

A look over the crops and the Agronomist is happy

New Wheat seed rate trials and putting Omnia to the test

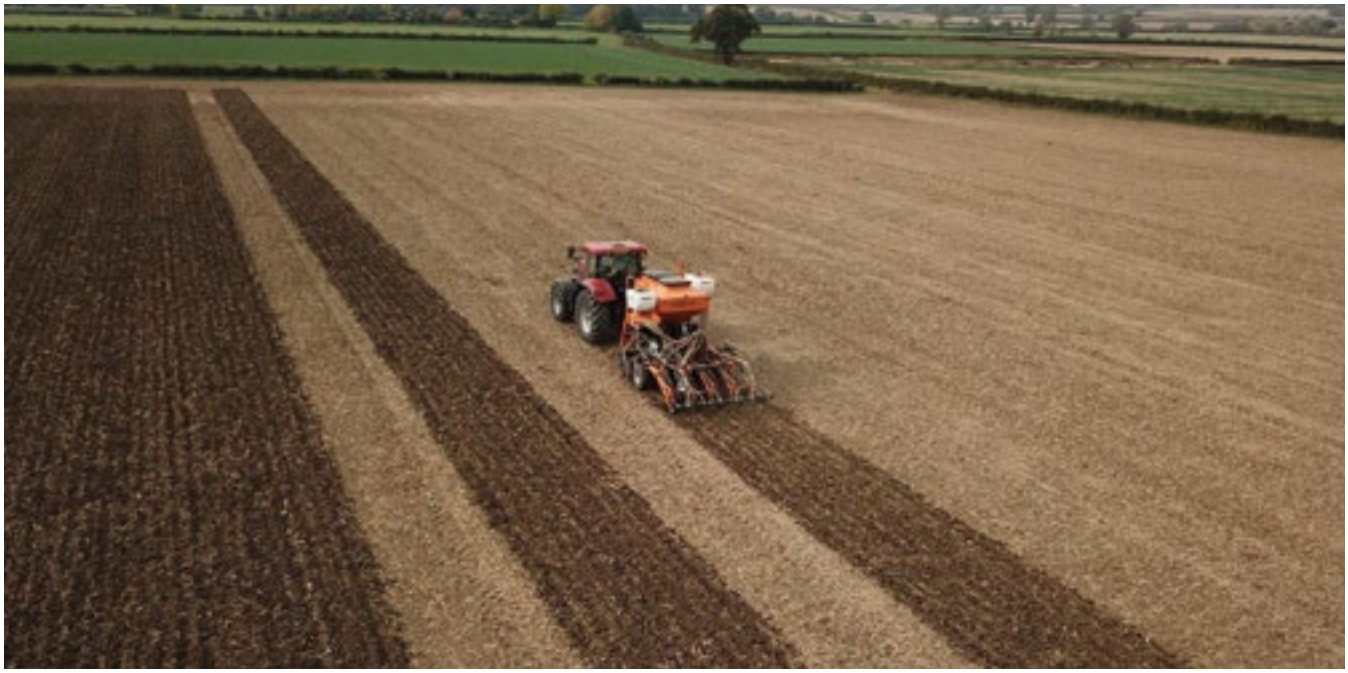
As a continuation of our seed rate trials we drilled Hybrid Wheat straight behind the combine. Seeded into part of the trial field that followed Soya, the topsoil had been left in a fantastic friable condition thanks to the previous crop.

Given what we had learnt from last year's low seed rate trial at 18kg/ha (Approx 40seeds per m^2) we decided to expand the trial to further our investigations with four rates ranging from 80 – 160s/m^2. We found that the low 18kg/ha seed rate produced huge numbers of tillers on each plant increasing the number of viable grains per seed planted. We are hoping to explore what it takes to optimise individual plant spacings to improve its ability to tiller whilst also allowing good air movement and light interception to support a healthy plant whilst not compromising on yield. I decided to replicate this trial in a larger field through creating 1 ha plots in conjunction with the hybrid variety Hyclick. This I hope will go some way to coupling the best of plant breeding with the planting accuracy and associated soil health of the Mzuri system.

Not ones to stop there, we are also working alongside the Agronomists at Hutchinson's to put their precision farming software Omnia to the test. In the neighbouring 10ha field Omnia aims to tailor inputs dependent on data drawn from mapping soil types, pest pressure and other factors deemed to impact crop establishment. From this data a seed rate file is produced which is used by our Mzuri Pro-Til to apply variable rate seeding.

This variable rate seeding has been applied to half of the field with the remaining half drilled at our standard blanket 320s/m^2 for this field.

Interestingly, the variable rate portion of the field ranges in s/m^2 by around 30% from the base rate across the 5ha but to the eye looks incredibly even in establishment. To measure actual establishment, we will conduct plant counts in each of the zones which will give us a better picture of how it has worked in practice. As the season progresses, Omnia will produce a tailored nutrition programme and coupled with the yield mapping capabilities of our combine we can look to draw a comparison to our standard farm practice. This is an exciting use of technology on the farm and one I will look forward to updating you on over the coming stories.

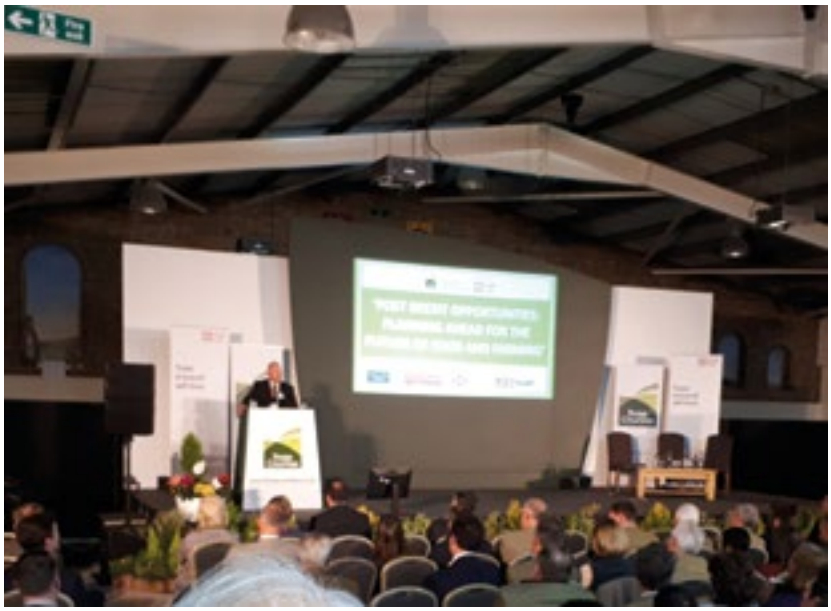


Drilling the Omnia trial field, testing variable rate seeding for improved efficiency

Malvern Farming Conference

20th November 2018

In the middle of the November, myself and colleagues enjoyed a thought-provoking evening at the Malvern Farming Conference with guest speakers including the NFU President, Minette Batters, MP Neil Parish and Head of Farming for the Soil Association, Liz Bowles. The topic of conversation was Post-Brexit Opportunities, which, on entering the discussion with many unknowns and several cabinet resignations on the same day, added to the sense of uncertainty. This being said, the speakers were excellent and were very positive on the outlook for British agriculture, focusing upon the quality and provenance of our domestic produce. Coupled with a signalling by government to focus on the health, environment and our soils, I left with a sense of optimism for how our way of farming is well positioned to meet the challenges and changes that are likely to occur going forward.



The event was thought provoking and provided some level of optimism in a difficult time

Autumn Open Days

23rd November 2018

Last week marked our second annual Autumn Open days in conjunction with Mzuri. Building on last year's success we welcomed onto the farm over 100 enthusiastic farmers and growers. Being my first official 'gig' as Farm Manager for Springfield Farm the pressure was on to deliver an insightful and interesting experience for all.

Starting with the popular farm tour I made sure to update our visitors on our latest trials including the side by side Omnia precision farming field and our extensive Wheat seed rate trials stretching over both Hybrid and Conventional varieties. Having seen the trials through from the beginning and drilling the entire farm myself this year I was confident that I would remember all the necessary details. Of course, this does come with the downside of not having anyone to blame for the occasional operator error!

Our Oilseed Rape is on top form this year

Digging for gold, perfect soil structure and worms can be found below the mat of crop residue

Discussing cover crops in our Oat plot

After lunch we sat down and looked in more detail at how the Mzuri strip tillage system has affected the farm in terms of soil and crop health, yields and profitability. We also looked at the typical savings and benefits achieved by other Mzuri users coming from a variety of different systems, a real eye opener when compared to traditional heavy cultivations.

Feedback from visitors was positive and everyone commented on how well the farm looked. It was great to talk to existing users, new users and those who are thinking about making the switch. It really struck me how the Mzuri system has had a resounding effect on farms up and down the country and has helped farmers take control of their businesses.

November Crop Update

18th December 2018

After the troublesome seasons earlier in the year, it was a great relief to have a much more favourable Autumn. Going down as one of the best, this Autumn provided near perfect sowing conditions for most of the UK, ourselves included.

Arrival of the Aphids

As it turns out, the season was also ideal for Aphids. Discussing this with our agronomist David Morris, it was apparent that large numbers of BYDV transmitting aphids were being reported at our local suction trap site located at Wellesbourne, as well as those we'd seen coming into the earlier sown Wheat.

The decision was made to spray the insecticide Kendo at 0.1l/ha, along with a nutritional top up of Manganese. The sprayer travelled fantastically well, as the little rain we'd received had been readily soaked up by our soils that were still in a moisture deficit even as late as November.

Wheat drilled with the dual band coulter on our Pro-Til 3T

Our Autumn open days attracted a lot of attention for the second year running

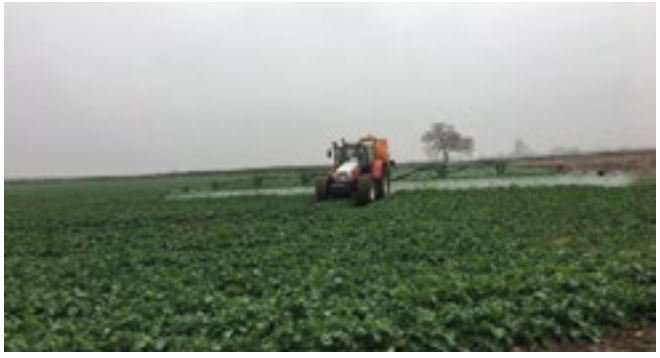
Autumn Open Days

Following this, we hosted our annual Autumn open days in conjunction with Mzuri and saw a flood of over 100 farmers visit our site over the course of three days. We were blessed with warmer weather compared with last year's harsh temperatures. Each year, farmers get a chance to catch up on our past trials and future plans and have the opportunity to look around the farm and facility.

IAgrE members visit the farm

Later in the month, a very enjoyable afternoon was spent with members of the Institute of Agricultural Engineers (IAgrE). There were some excellent technical questions brought forward, ranging from engineering through to agronomic. We braved the cold weather and climbed aboard our tour trailer to take a look at our trial fields and then back to the warmth of the factory where a thorough dissection of the machines took place! I really enjoyed hosting this group and their passion and depth of knowledge was remarkable.

Members of the IAgrE joined us to look more closely at the strip tillage system



Applying Astrokerb at the end of the month

Oilseed Rape Applications

Rounding the month off, I kept a close eye on the DOW Astrokerb postcode checker, which is designed to help optimise the timings of applications by considering forecast, soil temperature and rainfall. This seemed to take an age to give the correct conditions to spray, testament to the high soil temperatures we were benefitting from late into the year.

At the end of the month, Astrokerb was applied to our Oilseed rape to tidy up any remaining broad-leaved weeds and grasses. I combined this with the fungicide Prosaro as Phoma was easily found in our main farm variety of KWS Campus.

Stubble Turnip success for overwintered cattle

Farmer Focus: Edward Righton, Worcestershire

20th December 2018

With the Winter fast approaching and my drilling campaign now closed I made the most of the quieter period and visited a fellow Worcestershire Mzuri user, Edward Righton of Hill Court Farm.

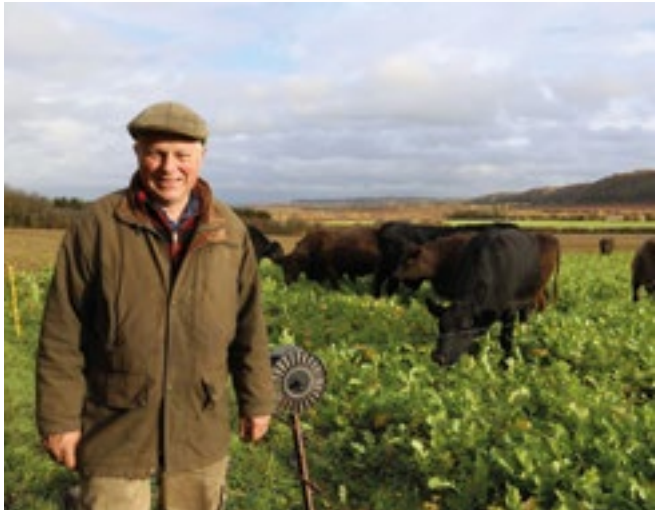
As a mixed farm, Mr Righton runs a herd of ½ Angus, ¼ Simmental and ¼ Friesian beef cows, a cross that he devised for their ability to thrive outdoors and suitability to his system. The cattle are outwintered until the end of January, when they are brought in a month ahead of calving to allow for monitoring and a tailored ration.

Keen to reduce his cost of production, Mr Righton looks to keep his cattle outside for as long as possible to minimise the daily running costs of a TMR feeder and a straw blower alongside the associated costs of loading, carting and spreading the muck of housed cattle.

This year, however, with unusual weather patterns including a particularly dry Spring, forage stocks were down by 40% going into Winter. The saving grace has been a bumper crop of Stubble Turnips, established with Mr Righton's Mzuri Pro-Til 3T.

Previously Turnips were established using a carrier to break up the surface of the soil to avoid the effects of chemical residue before being drilled, followed by another pass for the application of fertiliser. Mr Righton now achieves all of this in one pass with the Mzuri system. He believes that the loosening of the soil created by the Pro-Til's front legs allows for better rooting and has been the turning point for his Stubble Turnips.

In a rotation of Wheat followed by Stubble Turnips, Spring Cereal, Wheat and then Beans, Mr Righton has also been impressed with the ability to band place fertiliser below the seed, now possible with his dual tank Pro-Til. "The fertiliser at seeding has been very important, making nutrients available in a targeted manner under the seed to maximise the efficacy".



The turnips were drilled into baled Wheat stubble at 2.5kg/ha with 120kg/ha of DAP at seeding, followed by a secondary application of 120kg Ammonium Nitrate. Falcon was applied to knock out grass weeds and volunteer Wheat at an early stage.

Mr Righton operates a strip grazing system across the turnips and features a line of round bale straw positioned across the field for each break fence move. Using the bales to give a good indication to how hungry the cows are, Mr Righton moves the fence between every 1-2 days depending on the size of the section. Taking only 25 minutes to set up the next break, Mr Righton uses this opportunity to assess his cows whilst moving which contributed to significant time and fuel savings.

Not only has Mr Righton had a bumper crop of Stubble Turnips this year, he has seen other benefits to his farm since switching to the Mzuri Strip Tillage system in Autumn 2017. The most noticeable is the increase in farmland birds. Specifically, Pied Wagtail and Lapwing numbers are flourishing as a result of the sustainable eco-system supported through reduced cultivations.

It was a pleasure to visit Mr Righton and his cows and a big thank you to him for sparing his time. It is great to see how the Mzuri system is utilised in other farming enterprises and to hear farmers thoughts and experiences since switching their establishment method.

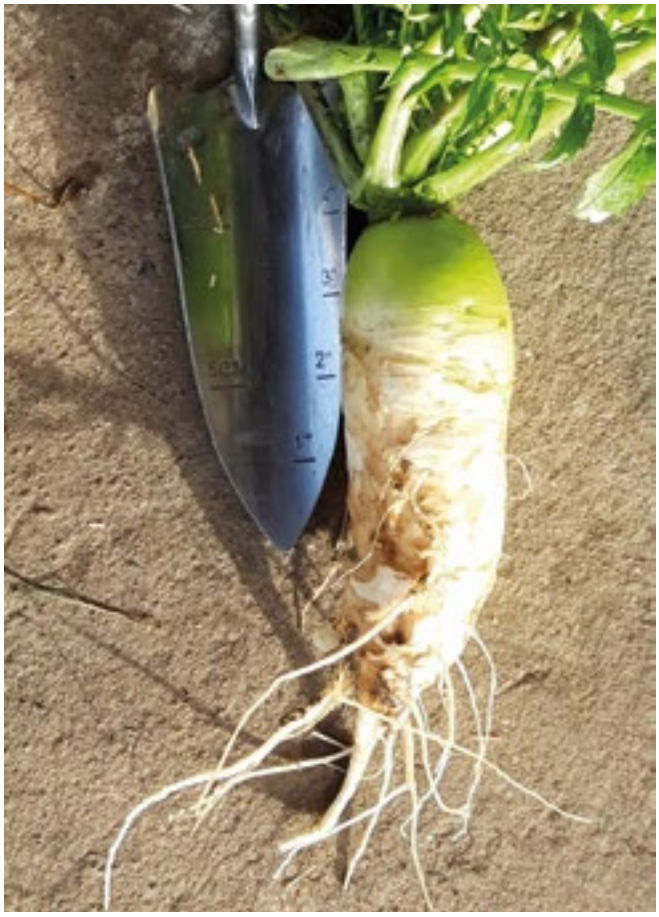
2018 – A year in review

21st December 2018

The year draws to a close with our soils still in moisture deficit, after what was an extraordinary summer. This year appeared to present everything, from biting cold through to March to the scorching heat carried well into Autumn.

It has never been more apparent that in an uncertain environment, us as farmers need to have resilient, well looked after soils and a system that can work in varied conditions. The key to achieving this at Springfield Farm has undoubtedly been through switching to the Mzuri Strip Tillage system in 2010. Beginning this year, with moisture seeming almost too plentiful those who cultivated pre-drilling were soon left with regret as the moisture lost from cultivation wasn't replenished thanks to the prolonged dry spell that came about almost overnight. This was much the case during the more recent Autumn where monthly rainfall figures were down. Pre-cultivated crops were noticeably slower out of the ground due to the lack of moisture in the seeding and surrounding zones, destroyed and dissipated by heavy cultivations. The one pass system meant that we retained moisture at every available 'pass' and without a doubt, our crops looked better for it. Namely, we had a flourishing Rape crop in an area that had very little to show for the Autumn work involved. Our aim as always is to build a strong, healthy plant setup in the right environment to cope with what the winter might bring.

Whilst sheep are normally a presence on the farm, grazing the old ridge and furrow pastures, they aren't normally found on the arable ground at least not deliberately anyway! This year however, the ground conditions under foot were excellent for the time of year and with having huge amounts of biomass on our cover crops, we decided to experiment with grazing them off. One thing I will say, I am amazed at the wonder of an ATV mounted electric fence system that meant we had a stock proof field in half an hour. Brilliant I thought, although I'm sure like anything sheep related, the term stock proof may be put to the test. First on the menu was the Radish mixture sown four months ago at 8kg/ha with 120kg/ha of DAP down the front legs, all in one single pass with our Mzuri Pro-Til 3T. Running this sheep show is our local shepherd Eddie, who commented on how the sheep took to it immediately, the novelty of grazing at head height, I guess. Next up will be our Oat cover crops, sown with grazing in mind - direct into Oilseed Rape stubbles which will hopefully provide a tasty blend of Oats and Oilseed Rape volunteers.



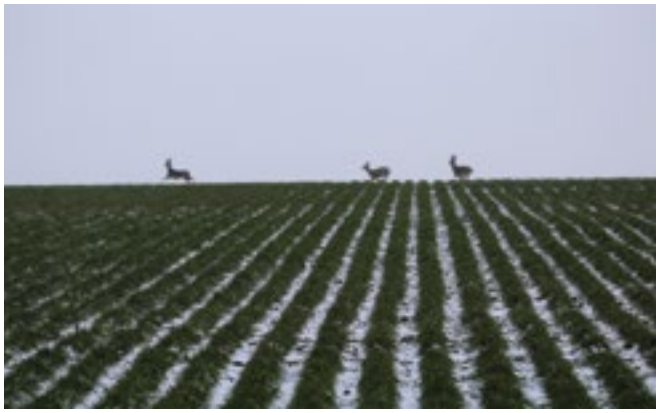
Radish cover crops are providing plenty of biomass for grazing

In the interest of experimentation, we will leave sections of the fields un-grazed (at least that's the plan – see 'stockproof') to see if there is any difference on the subsequent spring crop. I'm hopeful this will save us a pass of Glyphosate as the high biomass cover crops can often create a large amount of shading and therefore requiring two passes of Glyphosate for a complete kill.

Heading into Winter our hedgerows are brimming with berries and hips, after a fantastic pollination earlier in the year. We also made the decision to keep back our precision sown field of Maize and Sunflowers to support the farms wildlife through the Winter. The result, is quite a haven in the middle of the farm – I particularly like the dinner plate effect of the sunflowers, with a large number of heads already looking decidedly empty.

As always, with lots of trials on the farm, involving all of our different crops, 2019 looks set to be another interesting year. We're collaborating with a number of different organisations as part of these trials which will provide us with valuable independent insight – information we look forward to sharing with you over the coming months.

From everyone at Springfield Farm, we wish you a merry Christmas and a wonderful new year!



The start of the year saw a bitter Winter dragging its feet well into March

No light no problem for effortless hedgecutter

17th January 2019

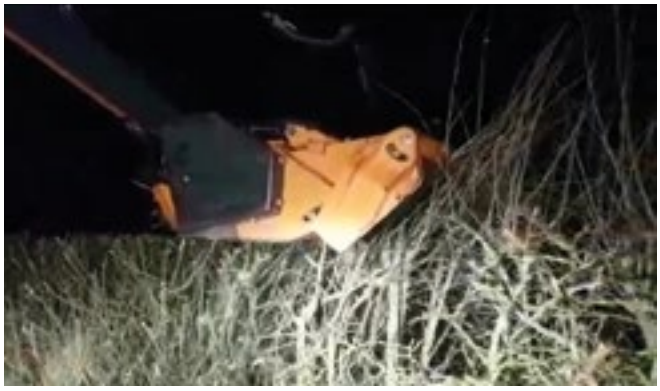
Welcome back! I hope everyone had a truly restful festive period, although depending on your sector some may be more well rested than others! We've taken it easy over Christmas and I've had the chance to play around with the Razorback Auto-level 550 rotary hedgecutter.

The farm has always operated an environmentally friendly hedgecutting policy that means we try to not touch our hedges before January to give wildlife the longest possible window to access nature's 'sweet treat' berries over the cold period. This also works well for us and gives me something to do during the quieter months on the rest of the farm.

You may wonder why we're cutting in the dark. There is no particular reason except that, with the shorter days at this time of the year, and with the Razorback being so simple to use with such light controls, it is just as easily operated in the dark as it is in daylight.

In fact, I filmed this whilst operating to demonstrate how smooth and clean the cut is. The machine's Auto-Level Co-Pilot technology is so responsive and advanced, that taking a hand off the controls needn't be a problem.

If only there was Co-Pilot technology for everything else in life!



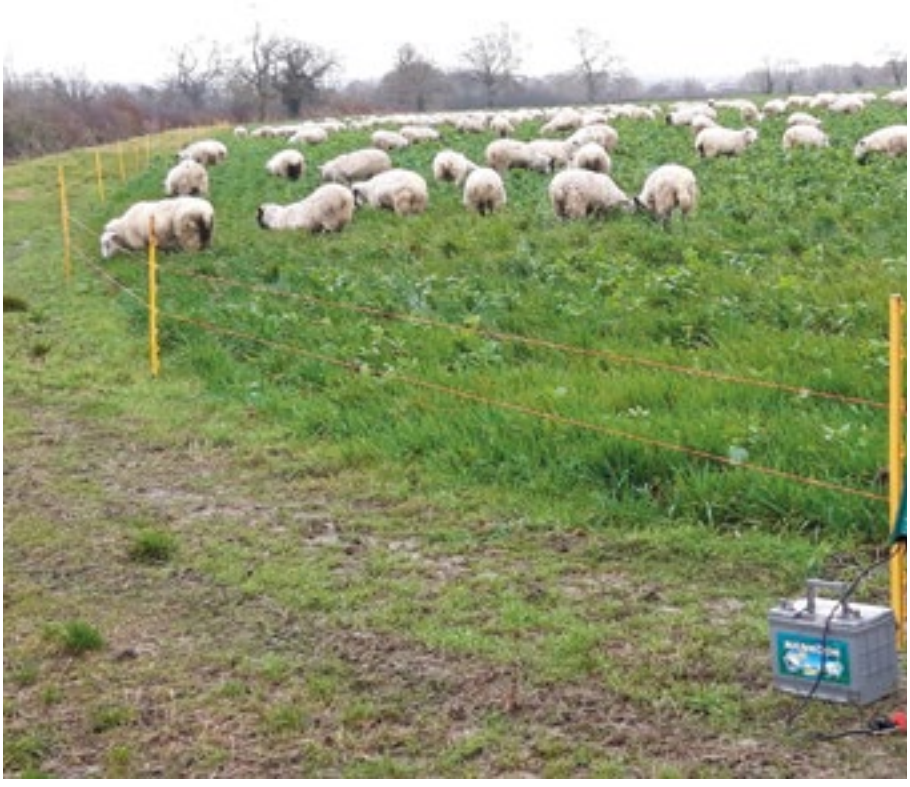
January Crop Update

5th February 2019

January has been a month for getting back into the swing of things after an enjoyable festive period. The main feature of the month has been our cover crops and our woolly friends who've joined us in managing them this year.

Cover Crops

Our cover crops are now starting to draw to a close. We've finished spraying off all of our typical Radish mix cover crops and the hard frosts have put the final nail in the coffin. This year we've also been running a grazing trial to look at what impact livestock makes on our current system. Our next diary entry features the findings of our grazing trial in more detail but, in a nutshell, we've had good success so far and the sheep have enjoyed themselves too!

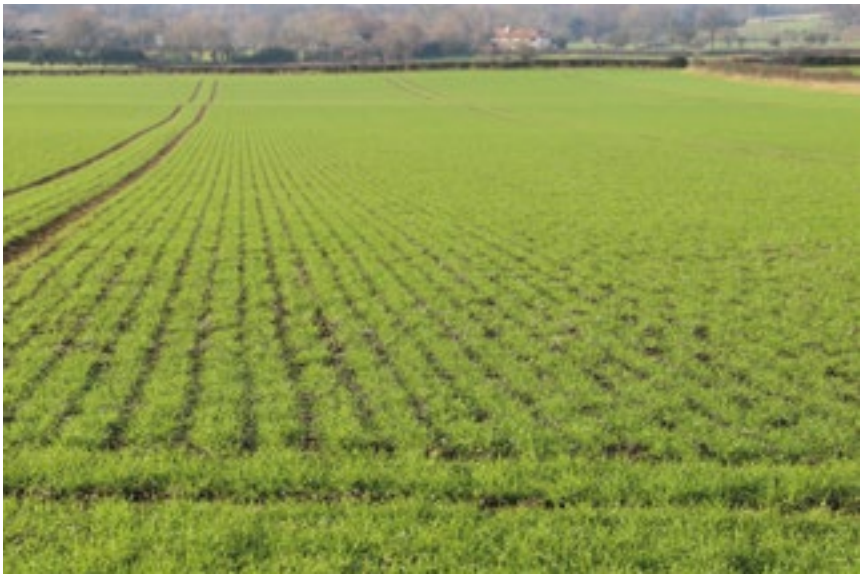


Tucking into an Oat and volunteer OSR cover crop - drilled with grazing in mind

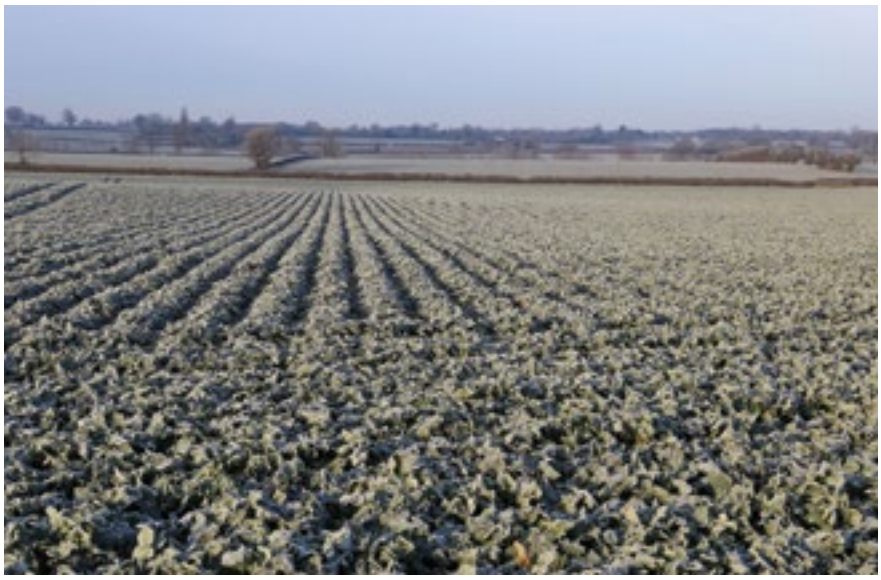
Wheat

During January we have seen noticeable growth in our Wheat crops, making the cold weather closing the month very welcome. Our Agronomist David Morris suggests the plants look like they are heading into April not February!

Overall the Wheat crop is looking very clean, with only our late September sown Costello drilled at 320s/m2 displaying low levels of mildew. I found this surprising, considering Costello scores 8 on the recommended list for resistance but, with our mild Autumn and Winter so far, I'm not sure it has ever really stopped growing. That being said, I'm not overly concerned about it. Costello remains our main variety and the rest of the crop around the farm is showing no symptoms.



Wheat across the farm is looking well and Costello remains our favoured variety - Taken 11th Jan



A couple of hard frosts in late January reinforced the Fox's effect

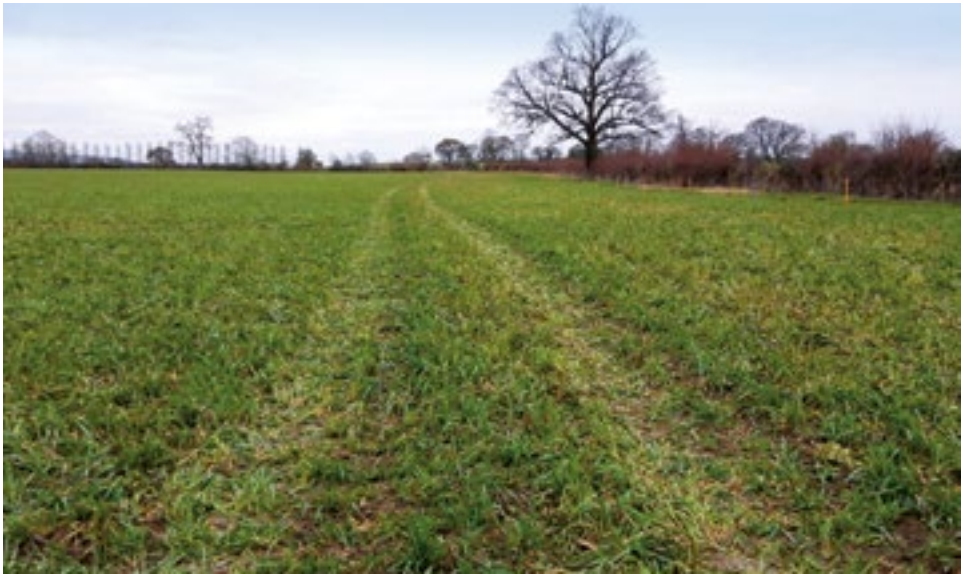
OSR

We started the year with a stock of strong OSR plants which was just as well, given that we weren't the only ones admiring the crop. The pigeon mob returned briefly but, considering we had achieved good ground cover from to corner to corner, I wasn't too worried. Nevertheless, they were swiftly evicted.

At the start of January, I applied Fox to a few of our fields to control Charlock. Done ahead of a frost, it has done its job, reinforcing the effect of the late November Astrokerb. The result is a very tidy looking crop as we head into February.

Dry January

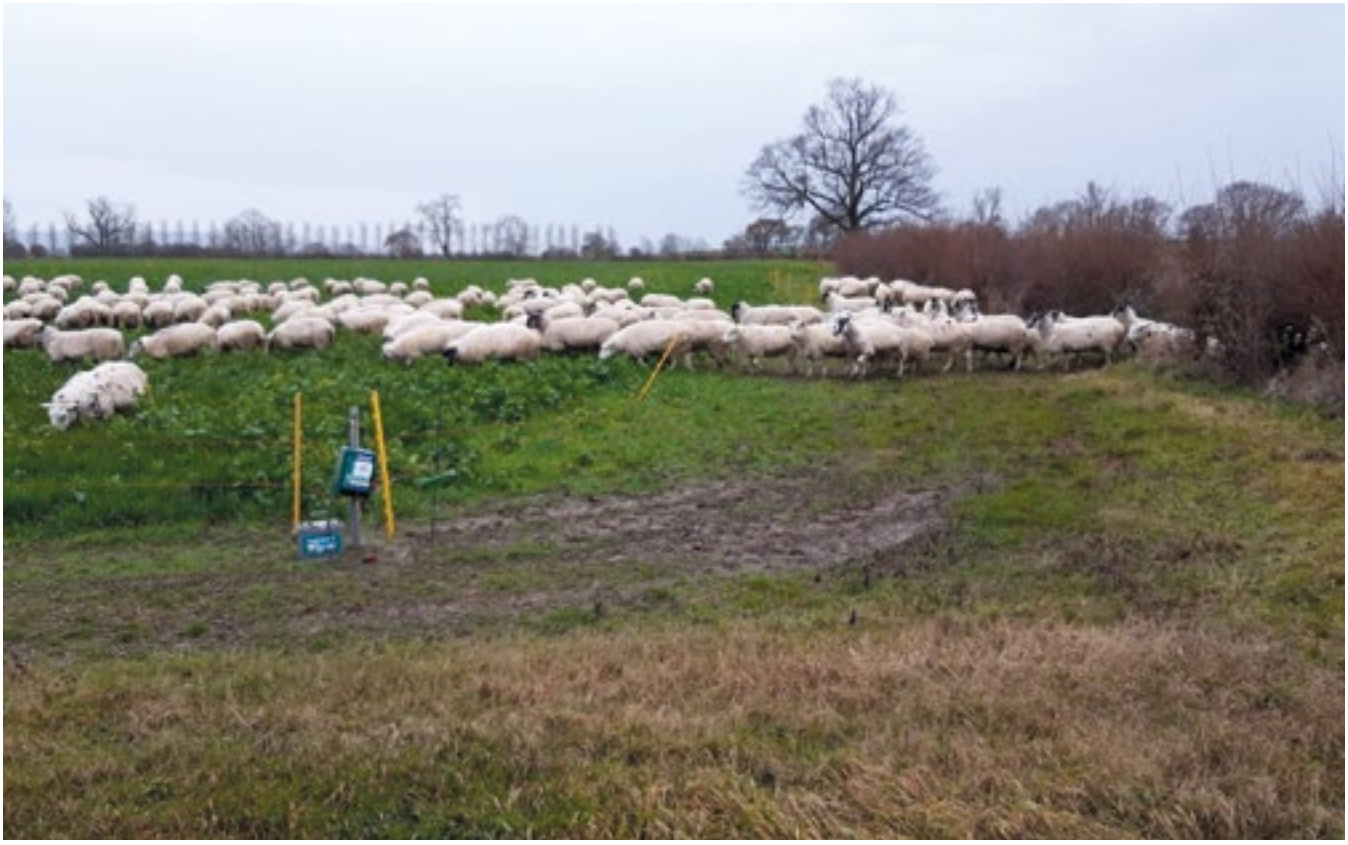
No this isn't a 'new year new me' mantra - our January really has just been that dry! This month we've received 20mm total rainfall which fell well short of our 53mm 20-year average. With our soils still in deficit, we hope to see the books balanced ahead of spring, although time is fast running out!



The dry conditions meant the sprayer was particularly light footed when spraying off the cover crops

Grazed Cover crop Trial

6th February 2019



The buffet is open - moving onto our Oats and OSR volunteer crop

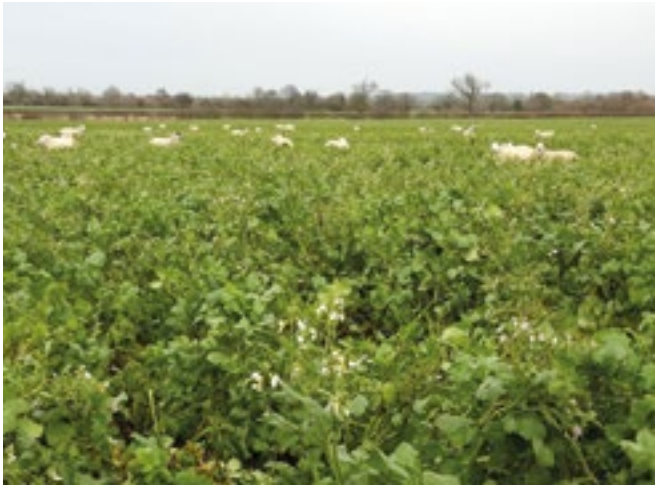
Cover crops are an important part of our system for a good number of reasons. We've found them to be one of the best ways to protect our heavy clay soils over winter and maintain beneficial rooting structures all year round - supporting good soil structure. We are also looking this year at how livestock can be incorporated into this portion of our rotation to make the most of Winter biomass.

This year we've borrowed some of our neighbours' ewes to graze off our cover crops. Alongside this, we reserved 10ha's of Radish for a grazing versus rolling trial and 3ha's of Oats to whole crop post grazing. After a total of five weeks of grazing the cover crops down, the sheep left the farm in mid-January.

Grazed Cover crops – Radish & Oats

Two different cover crop mixtures were grazed including a mixture of tillage and forage Radish, drilled directly into chopped Wheat stubble, and an Oat cover crop drilled into OSR volunteers. After the sheep had made short work of the Radish, the field looked like it been bedded down, with the layer of chopped residue emerging beneath. In a wet Winter, I feel this could be a real advantage, providing a buffer between hoof and soil.

Our first field of Radish that was grazed off coincided with a sharp frost, which resulted in a total kill of the plant as stalks became brittle – a double whammy and an excellent result I thought! The traffic of hooves across the ground, coupled with an inch of rain and mild weather, provided the optimum conditions for a flush of weeds. This will prove ideal for when we go in with a single pass of Glyphosate ahead of spring drilling.



The Radish mixture went down a treat with our recent visitors

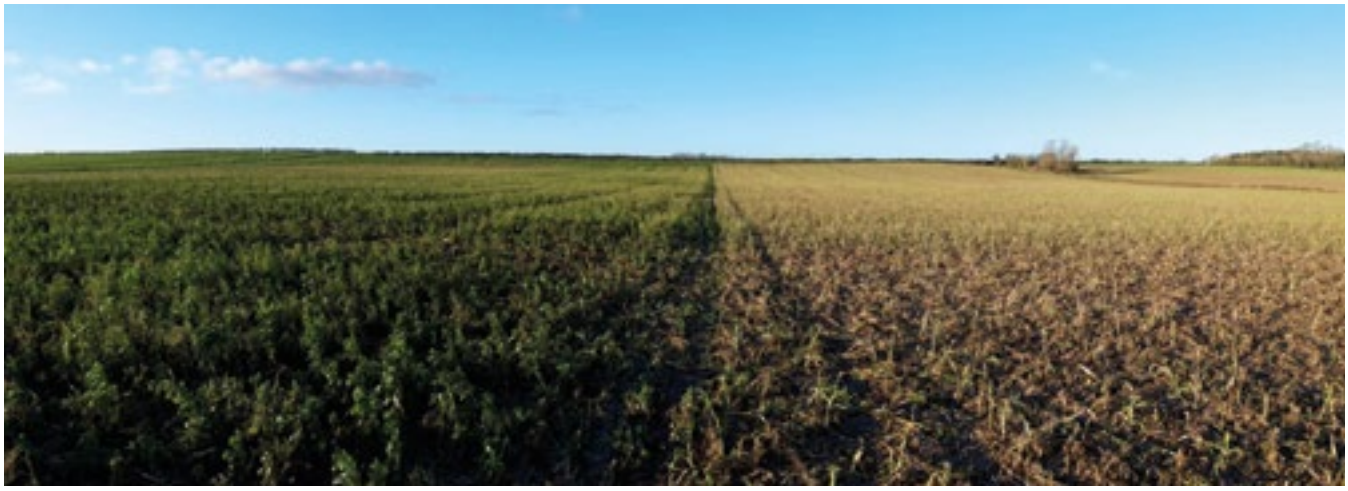
Early starts

As an alternative method of cover crop termination trial, we split 10ha of Radish into two plots. One half grazed, and the other half Cambridge rolled on a hard frost. The rolling method has proved successful for me in the past, as I've found the frost carries the weight of the tractor well. The plants are also at their most brittle at this stage and generally more 'receptive' to the roll!

The only difficult part of this method is getting out of bed in the small hours of the morning on a cold winter's day!

We hope the two methods will make for an interesting comparison. In a wet Winter, when we may be more reluctant to have sheep across our heavy clay soils, we will have an alternative low-cost mechanical way to help maintain the efficacy of Glyphosate in our system.

7 days later the sheep were making good progress



Radish - Right: Grazed, Left: Ready to be rolled

Post rolls - The heavy frost had made the plants brittle and the rolls achieved a good level of destruction

David our Agronomist looking at the regrowth on the Oats 20 days after the hungry diners had departed

Oats for breakfast

As an alternative cover crop, with grazing in mind, we drilled Oats into OSR stubble. The Oats went on to give us another excellent low-cost cover crop option. Our discerning diners grazed the volunteer OSR first, followed closely by the Oat main course.

During November's Open Days, we took a closer look at the Oat grazing mixture and the condition of the soil beneath. Many visitors commented on the prospect of taking the Oats through to harvest and, with this in mind, I've set aside 3ha to whole crop. The ewes had grazed down a considerable amount of biomass and cleaned up any mildew meaning the Oats head into spring clean.

After only 20 days post grazing, the plants had considerable regrowth and I'm eager to take it through to whole crop in late May/ early June. This will hopefully give us an opportunity to grow a summer catch crop – something to keep your eye out for over the coming months.

February Crop Update

7th March 2019

With record breaking temperatures, February has been a short and surprising month.

Wheat

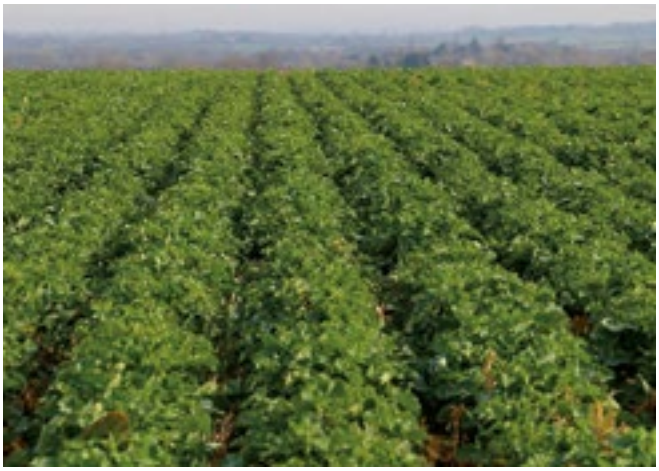
At the beginning of the month, we saw the final load of last year's harvest leave the farm. With the shed empty, it gave me the opportunity to square up the store, just in time for the influx of spring seed and fertiliser.

The Wheat in the field received its nutritional dressing of Sulfan at 180kg/ha which went on ahead of rain at the end of the month. This early dressing helps us to promote tillers and retain those that we already have. Looking after our tillers means our tillers look after our yield in turn!

Oilseed Rape

Breaking with tradition, we have been trialing a different variety of OSR. We're running side by side comparisons between our typical conventional variety, KWS Campus, and the hybrid variety, DK Expedient.

On first assessment, the Expedient had strong Autumn vigour and has continued to have notably greater Spring vigour over the Campus variety. With seed cost of almost double that of the conventional variety, the hybrid's traits will stand it in good stead, should we continue to see higher incidences of flea beetle and their larvae - making the price a little more palatable!



Rape on the farm has been doing exceptionally well this year

On valentine's day, I showed the OSR some love with an application of 200kg/ha of Sulfan. Unfortunately, I wasn't the only one fond of this crop in February; it seems, with the warm weather, pollen beetle have moved in ahead of schedule. Not yet at threshold, I'm keeping my eye on them whilst amazed that we're even thinking about this as early as February!

Sulfan going onto our Wheat at 180kg/ha

NRoSO course provided some thought provoking topics

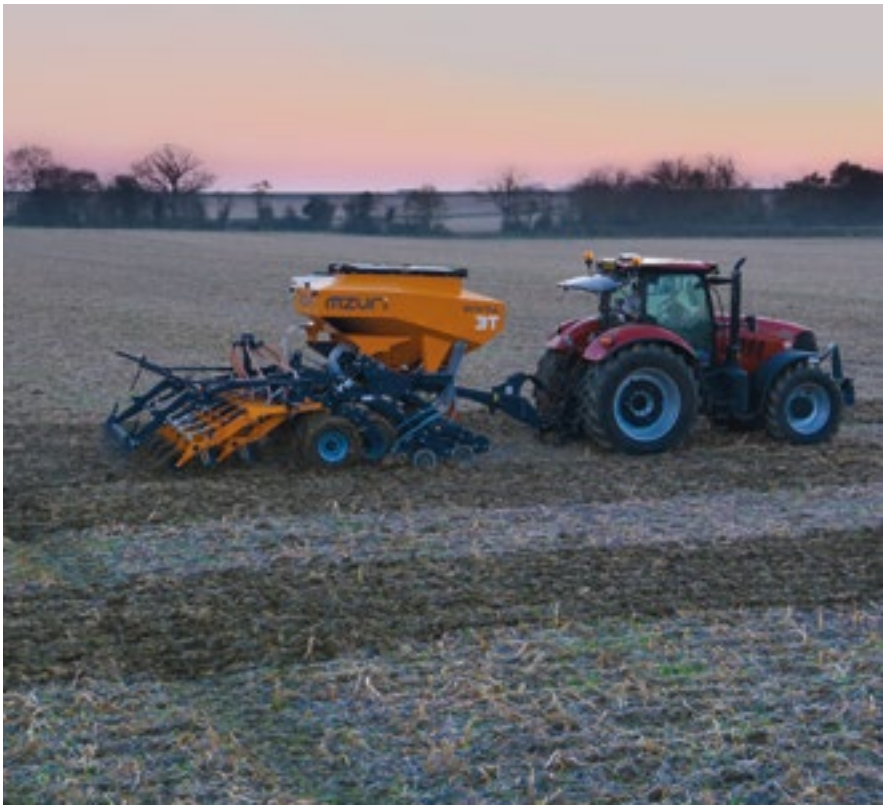
NRoSO Course

Topping up my knowledge, I started the month with the annual NRoSO course. This year, it proved to be more of a recap on legislation and best practice techniques rather than focusing on a single topic.

The meeting proved to be interesting nonetheless and the loss of important active ingredients made for a lively discussion. I thought this was neatly pulled together by a single slide showing the impact of the loss of certain seed treatments such as Deter.

Across a hectare or 10,000m2, a seed treatment applies approximately 58m2 of active ingredient, as opposed to the complete coverage of a spray. Accounting for a 94% reduction in chemical use which brings with it greater safety to the environment, the removal of such treatments certainly feels like a retrograde step.

With this in mind, I'm confident that continuing our focus on soil health is vital going forward, to help support healthy, resilient plants and to maintain a structure that limits run off and leaching to protect the tools we still have.



This year we're going with Spring Beans which are drilled at the perfect depth with our Mzuri Pro-Til 3T

Spring Drilling

With conditions practically unheard of for February, we had an opportunity too good to miss. The short-sleeved shirts were dug out of the wardrobe and we were away! This year, we're going for spring beans as our spring legume break crop. The decision, in part, was led by our dry winter. Having plants in the ground earlier to put down strong roots would be key to a successful spring crop in yet, again, another unusual year - cue us having a wet summer.

Brought in from a derogated seed lot at 70% germination, the Lynx beans appearance didn't fill us with confidence. Pinched and broken beans, along with plenty of bruchid beetle damage, prompted us to do a germination test. The results were positive and with the perfect nursery seedbed conditions that our Mzuri Pro-Til provides, we should have no problem establishing a good crop.

Inter-row companion crop trial

2nd April 2019

Over the years we've run numerous trials based around wider row spacings, this year we're embarking on something slightly different – inter-row drilled companion crops.

Last year we seeded Soya in 66cm row spacing with the aim to plant companion varieties in-between the rows. Time pressures and an incredibly dry season meant we didn't get around to drilling the companion crops, but the Soya went on to be the highest yielding on the farm.

The extra space meant the Soya had a wider untilled area from which to draw vital moisture and nutrients, as well greater light interception, to give the crop the best start. As a result, in a difficult year, the crop was 50% taller than its 33cm drilled counterparts and yielded better too.

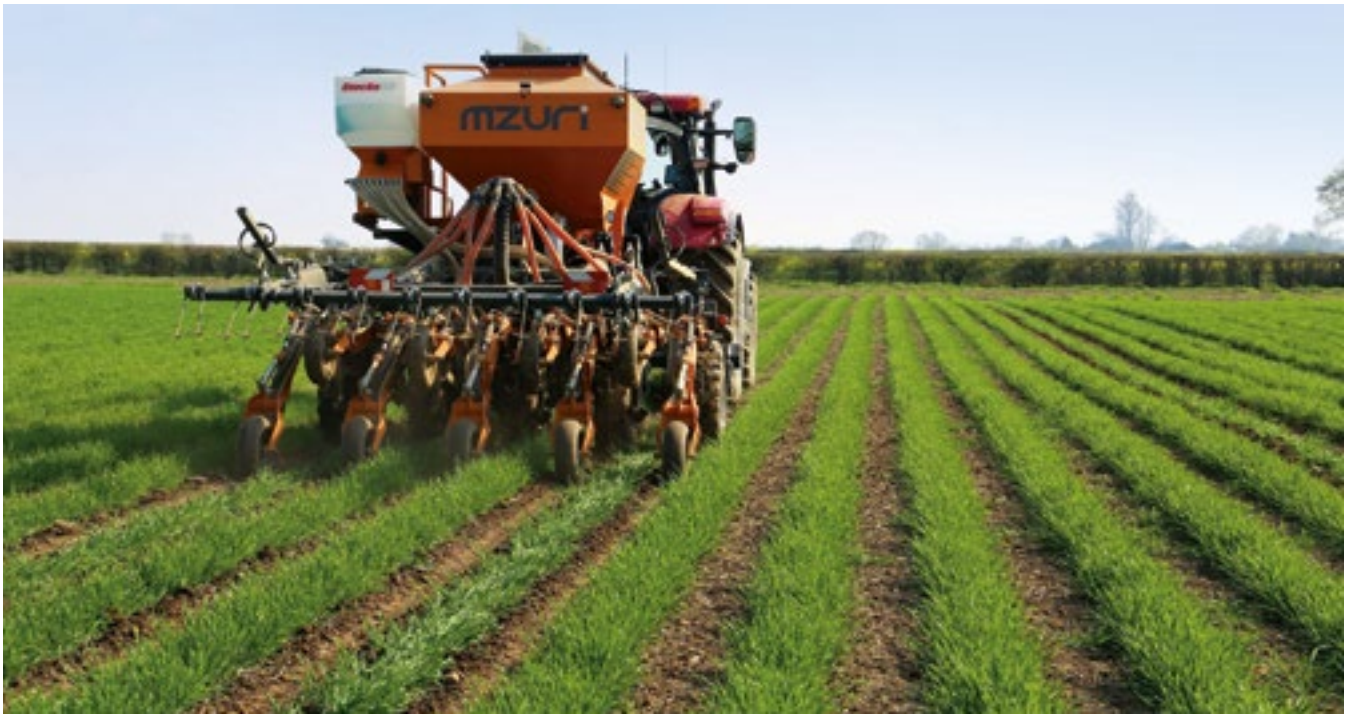
Picking up the experiment again, last Autumn we drilled wheat at 66cm row spacing with the intention of inter-row drilling the companion crops this Spring. As planned, on March 29th we went in with the Pro-Til 3T in Select mode with alternate legs lifted out of work, to give us the wider row spacing, minus every other reconsolidation wheel.

Our species of choice were Red Clover, Lucerne and Birds-foot Trefoil. We're aiming to leave these companions in for as long as possible and drill our arable rotation in-between the rows. Taking a leaf out of the organic farming book with the use of fertility building legumes, we look forward to observing the interaction between these species and our arable crops. We will also be looking closely at how we might manipulate the release of nitrogen, through growth suppression, during the season.

This will very much be a case of learning as we go along, and it will be exciting to document. We'll be keeping you updated on how the inter-row trials develop.

With alternate legs lifted up and corresponding reconsolidation wheels removed, drilling into the growing crop was straightforward and accurate

The Pro-Til 3T made a smart and tidy job of establishing the companion crop between the Wheat rows



The weight of the tractor was carried well by the untilled strips either side of the growing crop, meaning damage was kept to a minimum

In with the new

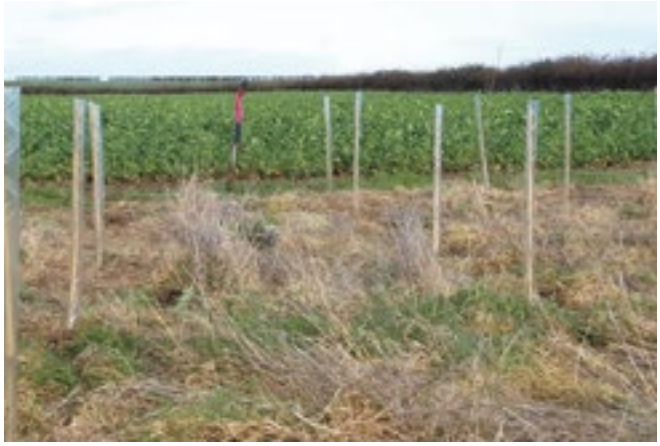
11th April 2019

During March I made an effort to tidy up some of the hedgerows around the farm. 'No, not with the hedgecutter!' I hear you wince, but instead paying close attention to those parts of the boundaries that are looking a little, well shall we say, sparse?

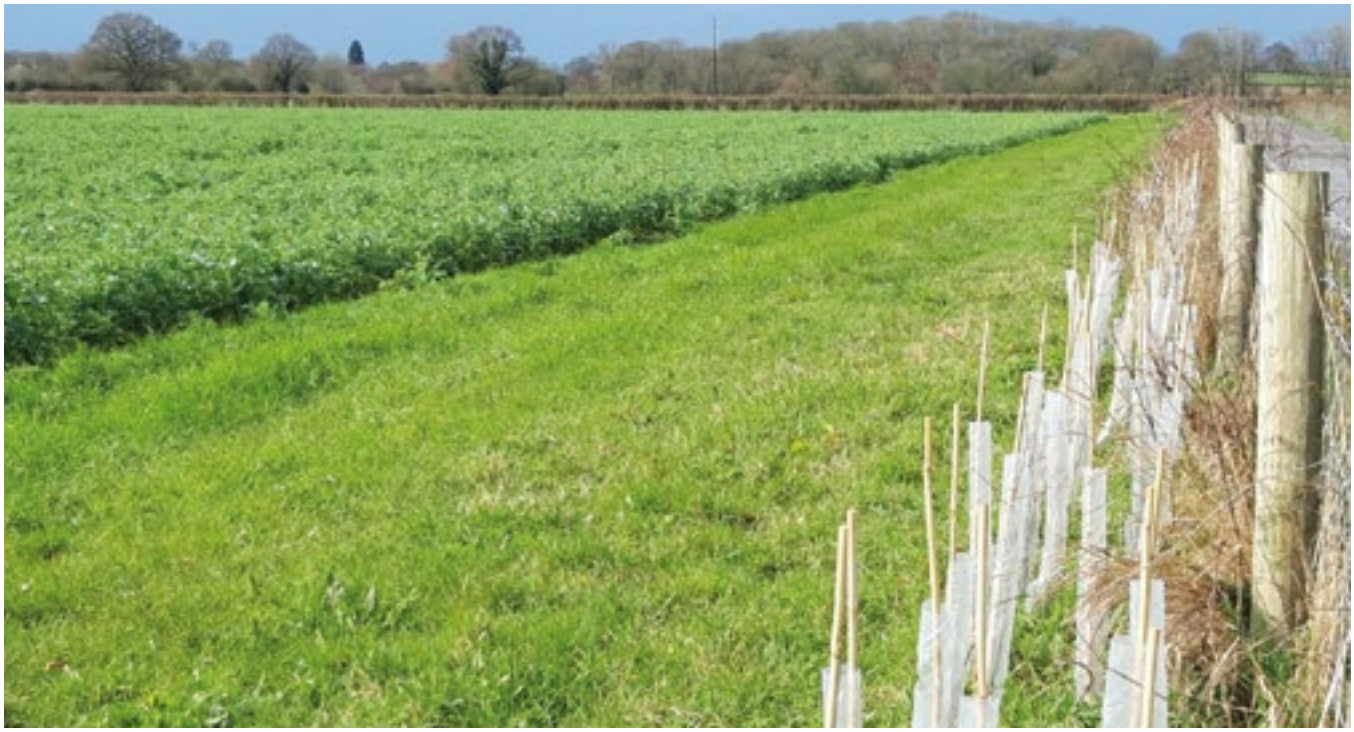
I opted for a mixture of hedging plants with species ranging from Hawthorn to Field Maple, Spindle, and Hazel. These will bridge the gaps where our hedges have been neglected, or where new hedges had been heavily topped by a rogue mower!

Along with patching up the hedges, I acquired a collection of suitable trees. A rather large collection actually, rounding up to 200 trees planted in the space of a week.

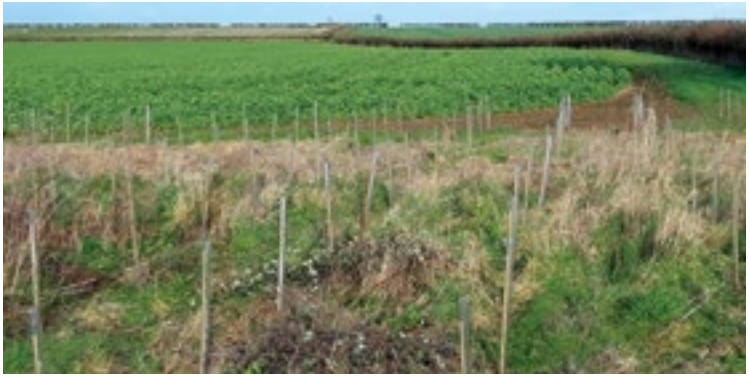
It must be said that the satisfaction of planting so many trees on our farm is equal to that of the impatience of wanting to see them grow and flourish. I've certainly got the back ache to prove my efforts, even if the view from the window is less than dramatic at this stage. We'll be sure to update you in 2029 with a progress report!



We've certainly been busy



A new hedge established where the last one was taken out by an over enthusiastic mower!



200 trees ready and waiting to spring into action

Jokes aside, it is important that we invest in these natural assets and preserve them for our farming future. Our hedgerows and trees are eco-system hubs that actively reward us by supporting birds and many beneficial insect species. So many trees have vanished from our landscapes that I would happily plant as many as I could, providing, of course, they don't impede our light interception!

March Crop Update

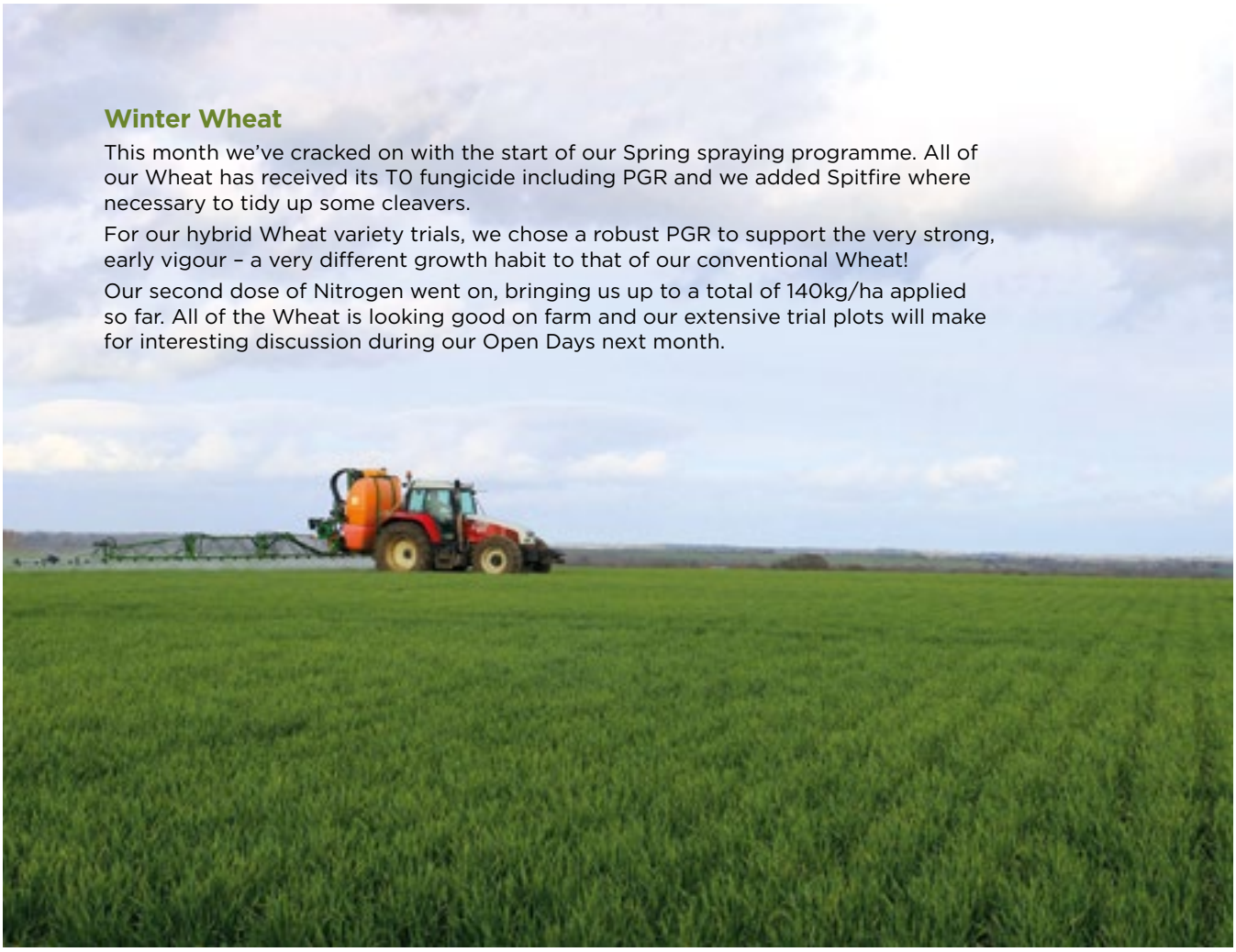
12th April 2019

Winter Wheat

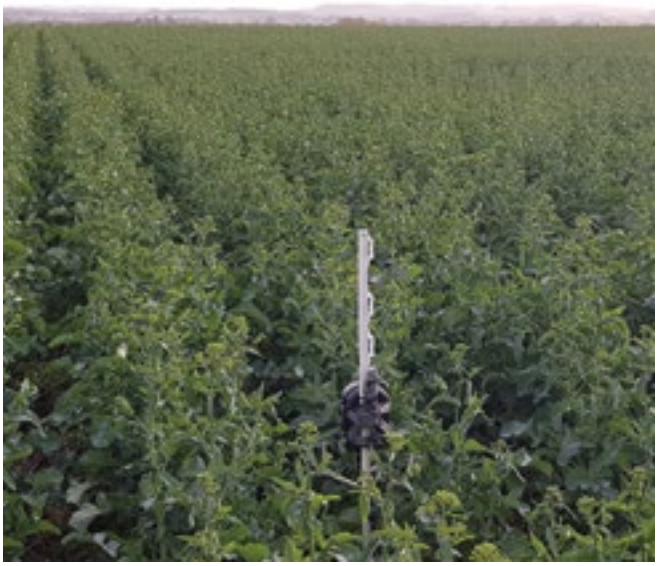
This month we've cracked on with the start of our Spring spraying programme. All of our Wheat has received its T0 fungicide including PGR and we added Spitfire where necessary to tidy up some cleavers.

For our hybrid Wheat variety trials, we chose a robust PGR to support the very strong, early vigour – a very different growth habit to that of our conventional Wheat!

Our second dose of Nitrogen went on, bringing us up to a total of 140kg/ha applied so far. All of the Wheat is looking good on farm and our extensive trial plots will make for interesting discussion during our Open Days next month.



Our Wheat seed rate trials receiving their T0's



Our 66cm row spaced OSR soon overtook our time lapse camera - taken 18th March

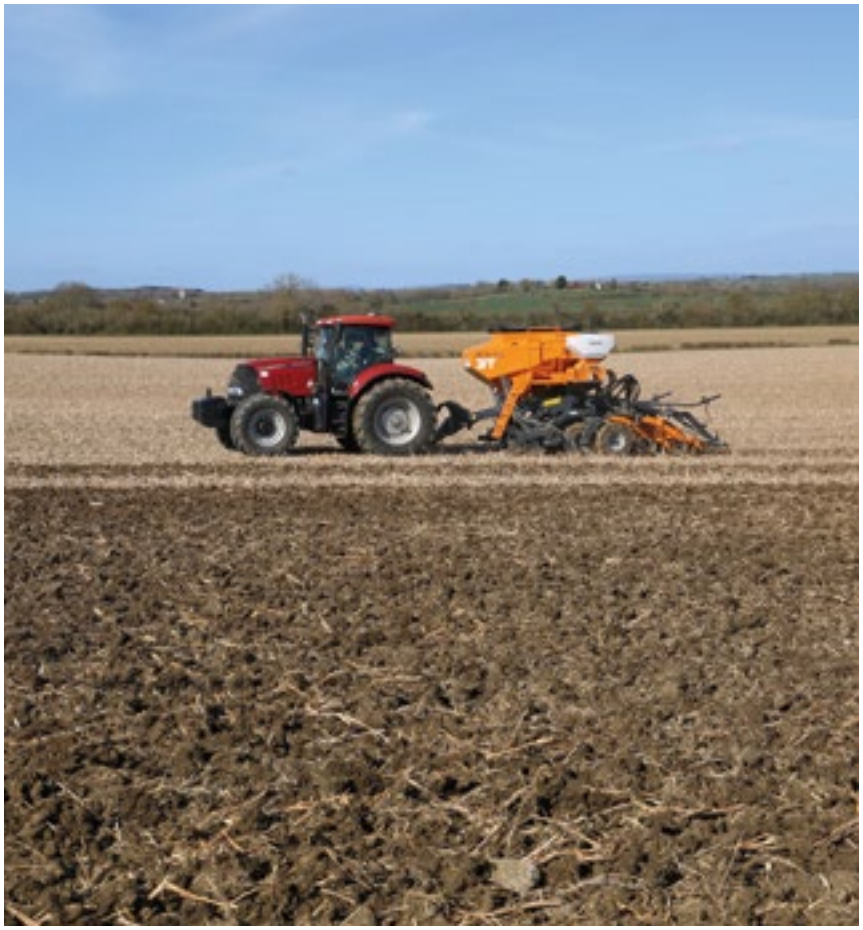
Oilseed Rape

Looking over our OSR at the end of February left me with initial concerns after a large influx of pollen beetle. Since then March came to the rescue with a cool and windy first half which appeared to hinder movement. At my own delight and that of my pocket, I got away with not needing to apply any insecticide – a top result!

Shortly after we applied the final dose of Nitrogen the Expedient came into flower on the 23rd of March. The same time last year we were just recovering from the Beast from the East; it's funny to think how years vary so dramatically.

Spring Beans

The drying winds during the last week of March saw us drill the remainder of the Lynx spring beans. All went into cover crops, where we used different methods of destruction – grazing, frost rolling and glyphosate. Using the Mzuri Pro-Til 3T, I drilled at 2 inches into preserved moisture. With what's been a relatively dry spring so far, we're starting to get the sense its going to be another year where moisture remains a precious commodity.

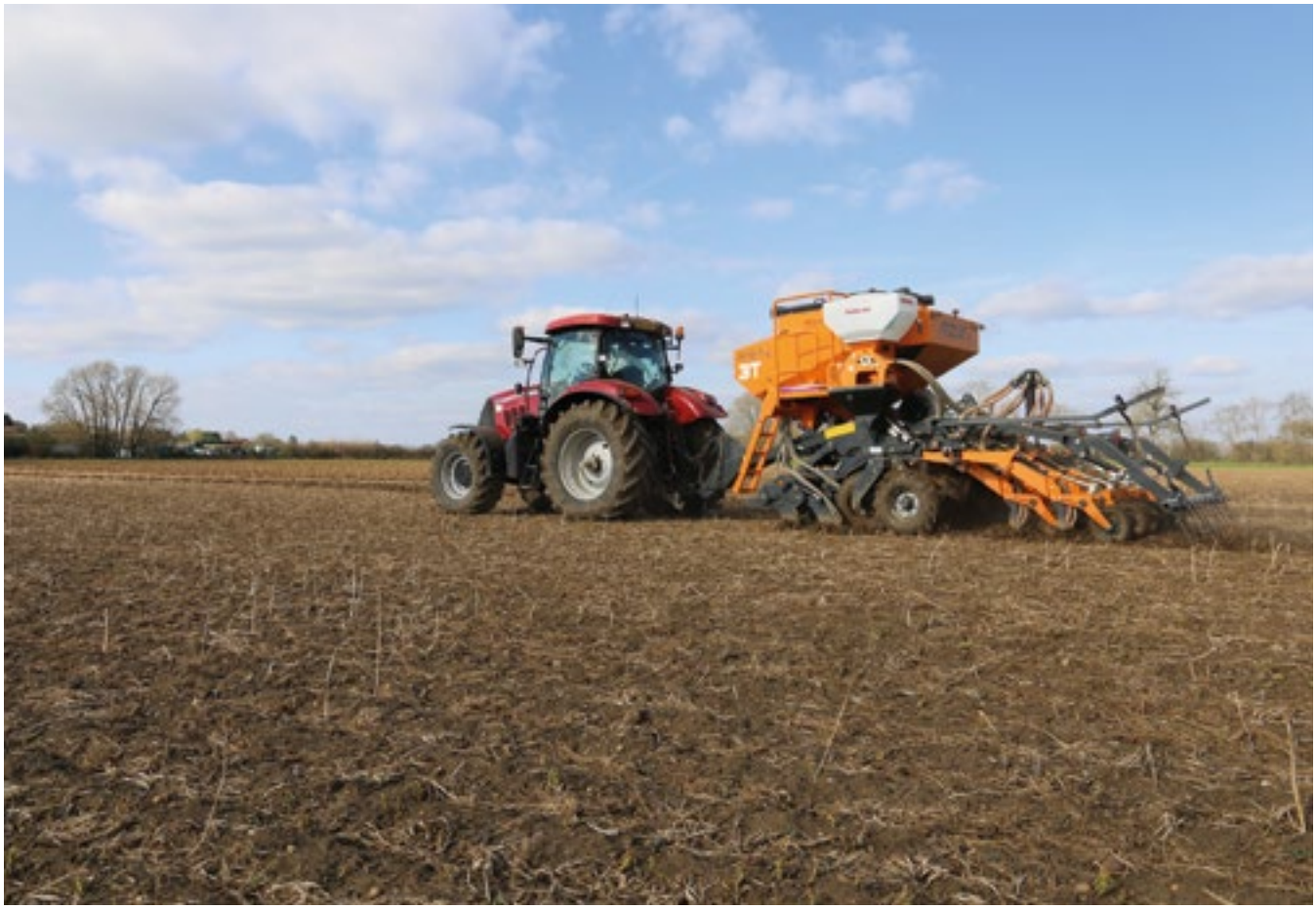


The Mzuri Pro-Til 3T putting Spring Beans into Radish cover crop stubble

Spring Wheat

We've added another Spring crop in this year's arsenal, Spring Wheat – which will have been grown on this farm for the first time since 2013. With everything we've learnt since then and with some strong new varieties coming through, we thought it would be interesting to revisit the forgotten crop. Opting for KWS Cochise, I hope to draw on its high yield potential, combined with its robust agronomic traits.

Along with 150kg/ha of DAP down the front leg, the wheat was sown at 400 seeds/m2. Following shortly after with an application of Sulfan, ahead of the rain, I ensured there was half of the crop's Nitrogen requirement in the seedbed pre-emergence. This should get it off to a good start and we're excited to see how this old friend performs on what's now almost a totally different farm.



For the first time since 2013, Spring Wheat is being established on the farm

Let's talk Oilseed Rape

1st May 2019

Once the much loved favourite of the British grower, the humble Oilseed Rape crop seems to be falling out of favour, and fast.

It seems that the problem is not necessarily localised but replicated up and down the country. On my travels I have seen countless examples of rape crops that have been less than inspiring, and either never came to anything in the first place or when it did, was ravaged by pests and struggled for moisture. It seems everyone I talk to is considering dropping it from their rotation as they battle with a crop that is consistently under-performing and over-costing!

Many farmers I have spoken to locally and further afield have had to re-drill into failed Rape crops that wouldn't get going. One grower, who had meticulously prepared his field with heavy cultivations and a power harrow combination drill was dismayed when his crop didn't even have the decency to show its head. Others have found that once crops did emerge, they were swiftly knocked back by flea beetle and pigeons.

As a result, it's suggested that there is likely to be a significant reduction in Rape ground next year as growers are frustrated with the crop that's no longer a favourable option and fast becoming a costly black hole.

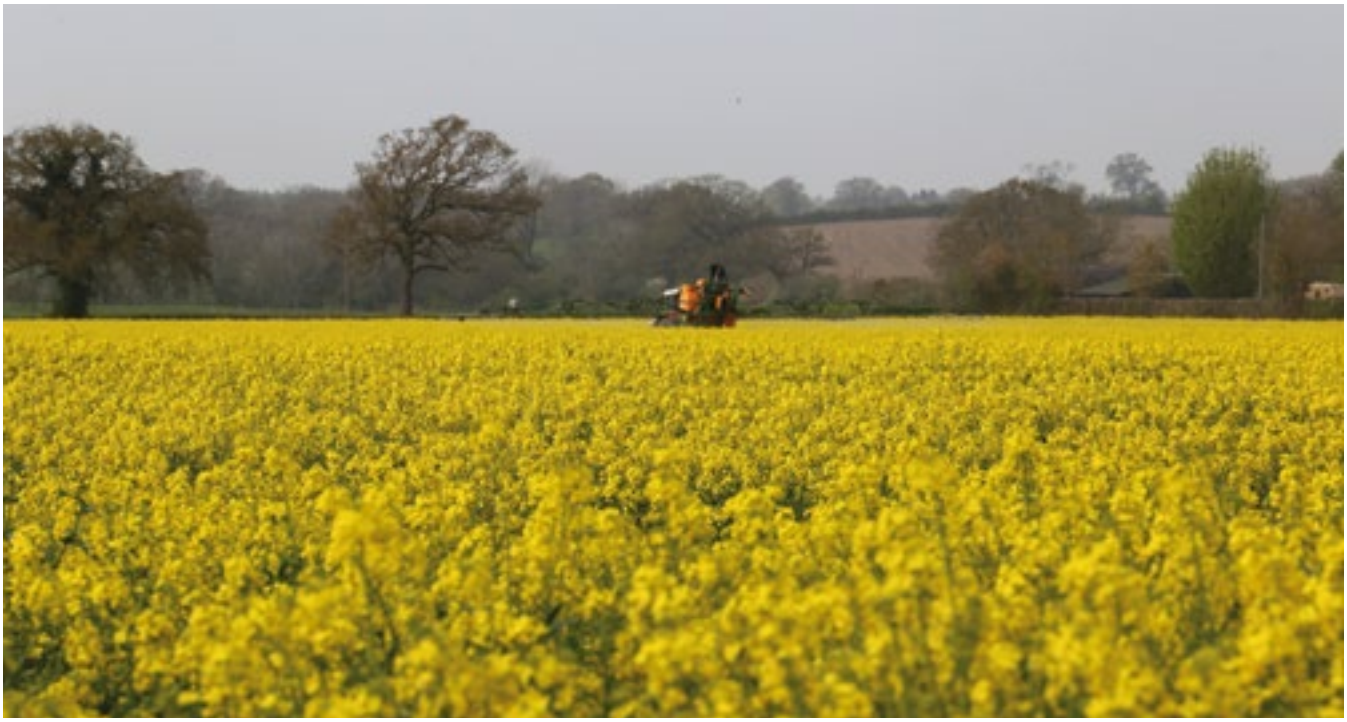
Springfield Farm was once too in this position, but rather than just Oilseed Rape, it was every crop that was underperforming and costing too much to warrant the effort and disappointment that went with it. The turning point? A change in approach to establishment – switching to Mzuri strip tillage.

Previously a plough and press-based system, the labour input alone was enough to send shivers down the spine and, with hefty costs associated with heavy machinery, the farm struggled to make ends meet. The farm's soils were consistently depleted of nutrients, moisture and an effective structure needed to support healthy and viable crops. The system wasn't sustainable, and this was mirrored in the falling yields and increasing costs.

It wasn't until the farm had a major rethink of how it established crops that this began to change. Converting to the Mzuri strip tillage system brought with it an overnight reduction in costs - ploughs, power harrows and all other unnecessary kit was sold and labour requirements slashed. Most exciting was the impact on yield; we're now consistently yielding over 4.5t/ha if not closer to 5t/ha – a much healthier sight than struggling to bring in 3! As we're no longer inverting the soil, the structure and organic matter content has been improving year on year, and, as a result, yields followed suit, with improvements seen from the first year onwards.

Crops benefitted from the retained moisture and nursery seedbed awarded by the leading leg of the Mzuri Pro-Til. Furthermore, the establishment was quick and even - something that is vital for a rape crop.

This ability to get the crop drilled into moisture and have it up and away in no time was the turning point for our oilseed rape. Having plants that are slow to emerge and lack vigour as a result of their environment are effectively sitting ducks for pests which is what we have been seeing a lot of around the country. Oilseed Rape can be a rewarding crop if given the right conditions and I can honestly say that it has been one of our best crops since we took the plunge to stop over cultivating and underperforming. And don't our fields of gold agree!



The even germination means our OSR flowers very evenly, only requiring one Sclerotinia spray

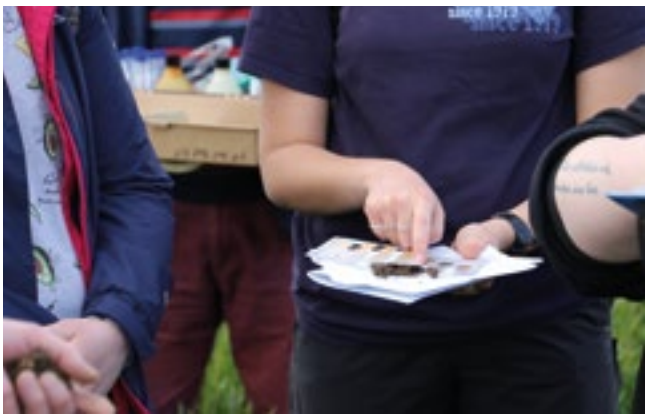
A visit from Worcester University

3rd May 2019

Every year we welcome the next generation of environmental scientists to the farm to have closer look at our soils. As part of their syllabus, the Bsc Environmental Sciece students from nearby Worcester University look at local soils, including Bishampton Series that creeps in on our Western border and Evesham Lias Clay which features heavily on our farm (excuse the pun!).

Accompanied by Phil Mullington, Soil Science lecturer, the group conducted several visual assessments of the soils, as well as checking pH levels. Despite the heavy nature of the clay element, the students were pleased to see that the minimal cultivations of our strip tillage system had left the soil in a friable condition.

It was noted that the roots of both the Oilseed Rape and Wheat plants that were inspected had a good level of mass to them with plentiful fine structures, easily removed intact from the seedbed. A small sample pit revealed that vigorous worm activity was apparent throughout the profile. The previous crop residue was being taken down through the many channels created by the worms, aiding aeration and water infiltration, as well as improving soil structure.



I explained to the students that plough based systems that invert the soil and its residue don't afford the worms the benefit of this above ground buffet which we know they prefer. As well as burying the nutrient-rich substance, heavy cultivations would only make our heavy soils work against us, something that this farm is certainly glad to see the back of. Years of trying to man-handle the clay soil into submission on a plough and press based system only resulted in an unproductive and costly 'seedbed'. Switching to strip tillage and removing unnecessary cultivations not only reduced our expenditure but allowed the soil to repair itself and flourish – better supporting sustainable crop production.

One of my favourite comments from the morning was that of a student with a keen ear. She commented on the high level of bird song she could hear - something that has always struck me about this farm - but until it is pointed out to you, you don't realise quite how rare it is nowadays.

I felt I gained as much from the visit as I hoped the students did from the hands-on experience. Phil Mullington is a wealth of knowledge on soil science and his passion for the subject is evident and it was great to exchange knowledge and compare notes.

April Crop Update

13th May 2019

Winter wheat & Bio stimulants

During April our Winter Wheat has received its third dose of Nitrogen, ahead of the rain and its T1 fungicide. Our T1 this year comprised of Bugle, Opus Team and Alternil Excel, along with a PGR top up.

Something different for this year is our investigation into bio stimulants. We've been looking more closely at these and their effect on the different varieties of our Hybrid Wheat plots. The bio stimulant of choice is Calibra Carbo, available from Arysta. As a cocktail of vegetable amino acids and seaweed filtrate it is said to improve rooting and boost protein synthesis.

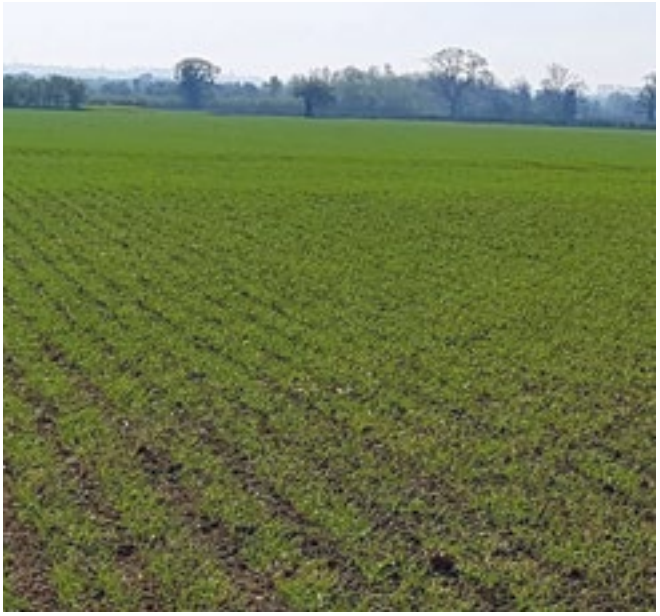
Across our 10ha trial field there are several different seed rates and hybrid varieties in 24m plots between the tramlines. To make a side by side visual comparison we went in with the bio stimulant across half of each plot, leaving the other half untreated. I am intrigued to monitor the plots as the season progresses and see if there is any noticeable change, especially if we are to see a repeat of the hot, dry conditions of last year.

Spring Wheat

I've been really pleased with the Spring Wheat since it was first up and out of the ground swiftly. During April, with all its NPK and S applied and a steady rainfall, it has really thrived.

Ahead of sowing we achieved a healthy flush of weeds which meant we had great control pre-drilling. Along with the PicoPro which is being aided by rainfall, the seedbed is keeping very clean.

The signs are all there for a promising crop of Cochise. With excellent early vigour the crop is now tillering remarkably well, and I am pleased that we have returned back to this previously forgotten Spring Crop.



Spring Wheat drilled with the double shoot coulter, up and even across the field

Graham Winter Wheat on the far side of our farm on some of our heaviest ground

Oilseed rape

On the OSR front, April has been an eventful month. With a run of frosts in the second week and storm Hannah, which brought sharp hail showers to the farm causing limited damage, the crop has certainly had its fair share of less than ideal weather fronts to deal with.

Despite this, the crop has benefited from a long flowering period in often warm, dry conditions and we're now seeing a pleasing pod set going forward. The crop, drilled on wide 66cm row spacings with the Pro-Til, has looked well throughout the season due to its even and quick establishment. It got up and away (ahead of the neighbours!) and is showing plenty of branching lower down the plant which I hope will give it good potential come harvest.

Towards the middle of April, I applied the final fungicide with Pictor Sclerotinia which is quite possibly our last pass through the crop before the combine. We don't desiccate our crops as we find they ripen much quicker and more evenly when left well alone, something that I have put down to over the years as a result of the improved soil structure from reducing our cultivations.

Spring beans

Another Spring crop that hasn't graced our farm for a while is the Spring Beans. With an excellent establishment that was bolstered by good seedbed moisture, they are coming along well.

Sown in February, the Beans made significant growth during the record Easter temperatures with a very good population, if not too good! I was concerned about the highly variable derogation seed but despite its official 70% germination, plant counts that have followed have shown that a higher percentage was actually viable, regardless of their disappointing appearance on delivery!

Bean weevil has been evident, but between rain and concerns over damage to our beneficial insects I opted against chemical control and favoured foliar micro nutrition to help keep the plant's growth beyond the notching, which has been the right decision.

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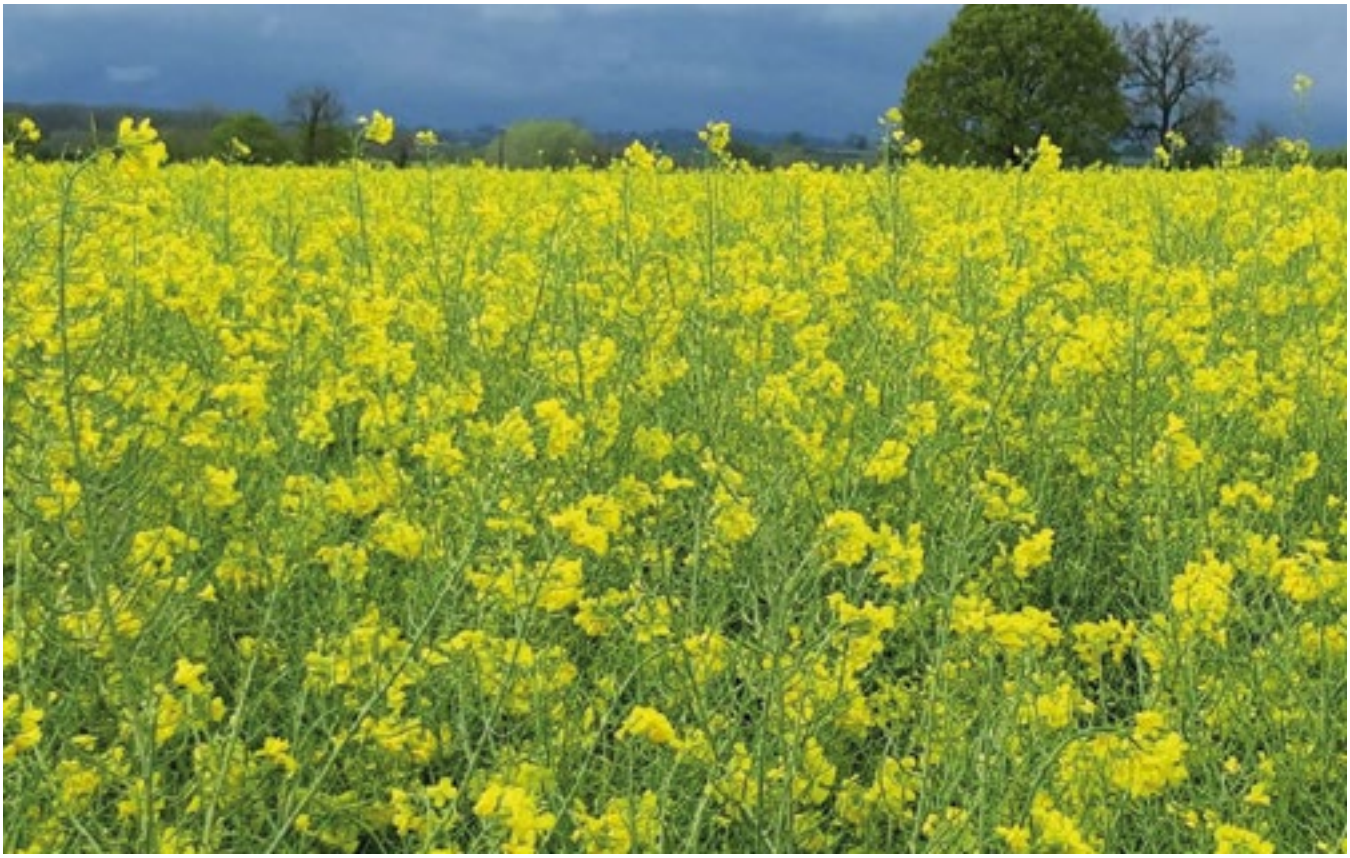


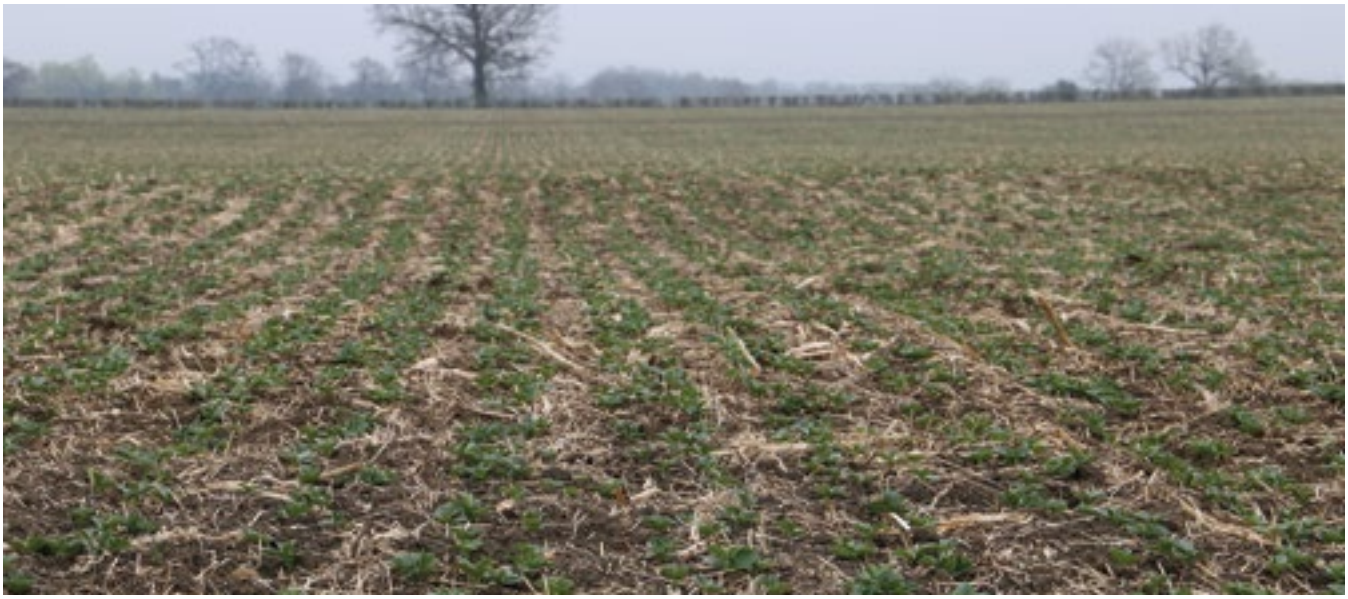
There is no shortage of pods on our OSR this year, great potential for a bountiful harvest

Rain Matters

The 46.5mm of rainfall (every fraction counts!) received in April, was very welcome and brought our year-to-date total rainfall figure to 108mm. It is no lie that this is significantly below where we would normally expect to be at this time of the year, but with most of our Nitrogen now applied and washed in and with good rooting structures in place, we are as well set as we could hope to be.

The beauty of our strip tillage system, made possible with our trusty Mzuri Pro-Til 3T, is that valuable moisture isn't lost at drilling. With no heavy cultivations to release this precious commodity it is instead preserved in the bank for times of need – call it a 'rainy day' fund if you will! Protecting this soil reserve extends the crop's ability to withstand unusually low rainfall, like what we're experiencing now.

To a degree, it could be said that in these circumstances our heavy soils are a blessing, but I have seen countless examples of where growers on light soils have equally improved the ability to retain moisture by increasing organic matter and improving structure through adopting strip tillage techniques, thus nurturing a soil better equipped to support crops in dry seasons.



Beans are up and away in their double shoot rows, with a good - if not too good - population!

Spring Open Days

31st May 2019

Being a Mzuri trial farm means we often host groups of farmers who want to see how the Mzuri strip tillage system performs in practice. Since we converted over 9 years ago, we have seen vast numbers of farmers and industry experts visit the farm taking an interest in soil health and looking at the different available options for reducing cultivations.

From university students to MEP's and farmer groups our farm regularly plays host, but one event is often the most anticipated of the year. Our Annual Spring Open Days offer the chance for not only a farm tour but also a live in-field demonstration of the Mzuri Pro-Til 3T.

This year was no different and we welcomed over 100 growers to the farm in the middle of May.

As Farm Manager I lead the day starting with a farm tour, favouring the warts and all approach I made sure to show our visitors as much of the farm as I could including trials that hadn't turned out as planned! Namely, our companion crop trial which had been hampered by the Wheat cash crop's pre-emergence.

We followed with looking at our Rape fields, with the farmers being particularly impressed with the Hybrid variety expedient, which had performed well throughout the season and now stood out as the top pick, in an already impressive group of fields.

Spring Beans were next and after sharing my experiences with Soya last year, I was pleased I had chosen to stick with traditional Beans given the season so far. The lack of moisture had been mitigated by drilling directly into stubble and even establishment had been achieved via the small strip of tilled soil. The results of an impressive establishment were evident during the farm tours as all of the spring crop across the farm were growing away nicely.

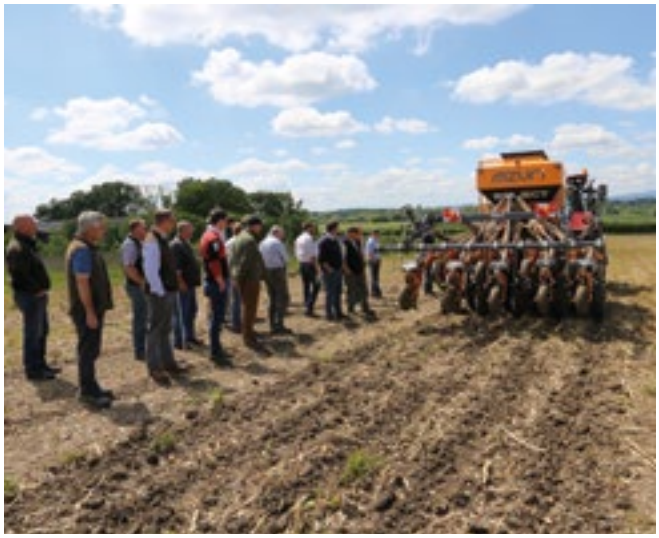
I was pleased to share our various trials across the farm including Hybrid Wheat and OSR, seed rates, Omnia precision technology and Bio-stimulants. Our usual comparisons between row width and seeding coulters also featured and I enjoyed discussing the benefits of increasing light interception into the crop, particularly relevant for Oilseed Rape plants.

Our tour finished with a demonstration drilling Maize into stubble with the Pro-Til Xzact precision seeder. Despite the heavy nature of the soil I was delighted when several farmers commented on the way the ground broke up into a fine tilth in their hands, something that itself testifies to the benefits of reduced cultivations.

If you would like to visit us in the future either keep an eye out for our next Open day, or get in touch.

Discussing what we found with growing Hybrid Wheat on the farm

Spring Beans have been a welcome alternative to last year's Soya



Drilling Maize into stubble with the Mzuri Xzact Pro-Til 3T

May Crop Update

7th June 2019

Winter Wheat

Being an important time for Wheat, we applied our flag leaf spray on out conventional varieties on Sunday 18th, half the fields covered in the morning and half in the evening. It seems that the best spray days have a funny habit of falling on a weekend, but being such a key component of the yield, it's worth the effort to avoid the heat of the day and achieve the best coverage.

Our Hybrid Wheats are continuing to surprise and impress, with five different varieties in total, each with different traits. They are all early developing when compared to our conventional varieties Graham and Costello, however I was taken by surprise when the Hyking and Hynvictus varieties displayed their flag leaf in early May with the ear fully emerged by the middle of the month. Having a Wheat that allows us to drill the WOSR earlier, with the potential to deliver a greater margin over Winter Barley makes for an interesting prospect indeed.

OSR

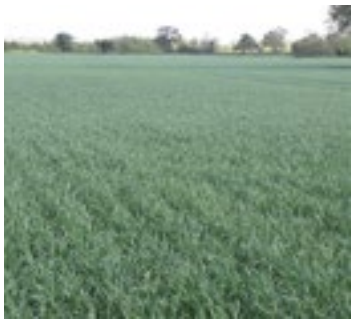
With our Oilseed Rape crop establishment even across the field thanks to the consistent seeding depth of the Pro-Til's independent coulters, the crop goes on to flower evenly too. This has the benefit of shortening the flowering window and our OSR typically only requires one Sclerotinia spray which was applied in late April. With all our passes through the OSR complete, it's now just a waiting game through to harvest.

The middle of May saw a welcome inch of rain fall on the farm which helped swell the seeds. Although a famously deceptive crop, both pod length and canopies look promising, especially if the weather pattern of steady rain and sun continues – I will certainly look forward to seeing if the combine reflects this.

During our Spring Open days there were many positive comments made about our crop of Hybrid DK Expedient OSR, which has been billiard table level from corner to corner, crammed with pods – the most even crop many had seen in a long time!

Spring Wheat

This month our crop of spring Wheat received its first fungicide, along with a PGR in mid-May. We've seen some impressive tillering from this crop which has been supported by retaining moisture at sowing and now with regular rainfall, the crop is showing real promise. Having the Hybrid Wheats on site has proven to be useful in sharpening my crop development monitoring which has given dividends as the Spring Wheat moves rapidly through its growth stages.

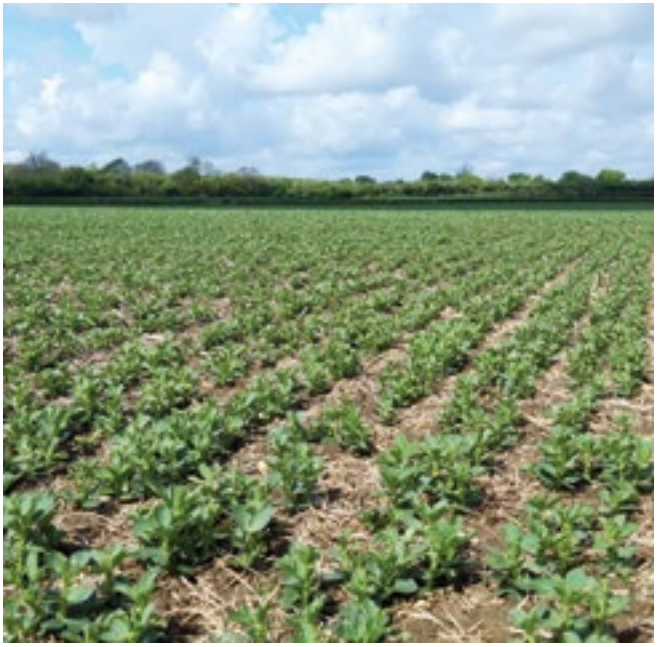


Maize

Maize sown during the open days received it pre-emergence herbicide the following day along with the remaining fertiliser. We've got all of our fingers crossed now for some rain both for the efficacy of the herbicide and to wash the fertiliser in. Last year compound could still be found on the surface six weeks after application - not a sight I want to see repeated.

Spring Beans

Towards the second half of the month I applied an early flowering fungicide on our February drilled beans, in combination with foliar micronutrients. The crop has been a real pleasure – visually, as it fills with flowers, to the ears with bees humming away as they relish the pollen, to the nose when you catch the odd plant in the tramline. It's certainly not a bad office that we get to work in!



Speaking at Cereals 2019

14th June 2019

As farm manager of Springfield Farm and an advocate of soil health, I was invited to speak in the Conservation Agriculture Theatre at Cereals this year and I was only more than happy to accept. I was delighted to be a part of something that challenges the status quo and gets people talking about the many different ways of thinking surrounding the agricultural industry and particularly, preserving our soils. I chose to talk about how we can 'Future proof your business with Strip Tillage' and although trying to avoid the B word the concept remains the same for any future uncertainties we may face.

I eagerly prepared the presentation and perfected my speech in anticipation of the big event with the date fast rolling round and I made sure to make myself a note to pack the sun cream for what is usually the hottest event of the year!

Wind forward two months and the sun cream may have been a little presumptuous. It was without a doubt that Cereals 2019 has been my wettest to date, and with huge amounts of rain falling across the country in a small window, Lincolnshire was no exception.

Undeterred, I was pleased to see so many people make the effort to attend given the pretty awful conditions. I certainly wasn't going to let the rain stop me from sounding the horn for soil health and if anything, I thought the downpour may improve audience attendance in the warm and dry theatre!

I'm getting pretty used to talking in front of audiences and when the subject is strip tillage I am in my element. The presentation went well, and I was pleased that I had attracted a reasonable crowd of people, who may have sat down to dry out, but certainly left with an insight into strip tillage!

June Crop Update

10th July 2019

Winter Wheat

Always a favourite spray timing of mine on the wheats, the T3 fungicide was applied during the first week in June. It was with some relief that it was done in time as the amount of rain that followed shortly after was unexpected to say the least! Over 4 inches of rain fell in the space of 3 weeks, which amounted to 40% of our year to date total, which coupled with often warm daytime temperatures would have provided the ideal environment for disease to take hold had we not managed to apply the fungicide in time.

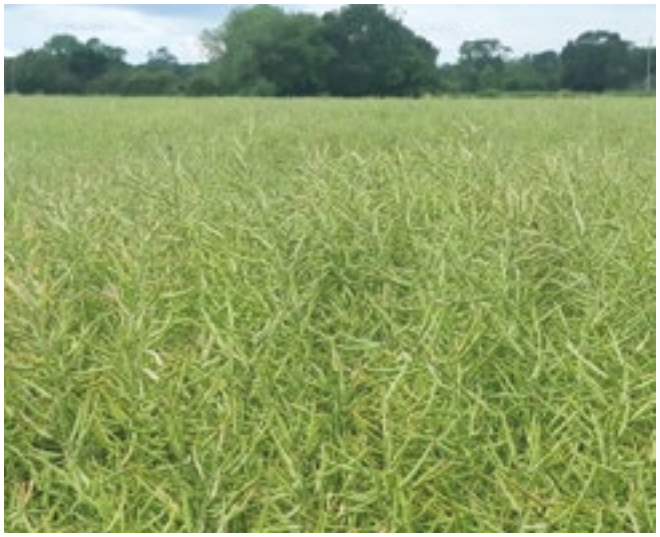
With June seemingly the month of agronomy open days, providing a good chance to top up NRoSO and BASIS points, I attended a couple of events locally. Whilst the season appeared originally to be low on disease pressure, by June both the untreated and even some treated varieties in the region looked anything but. Our selection of feed varieties with robust disease profiles, coupled with a healthy growing environment both above and below ground delivered clean well tillered crops as we entered the key yield building month.

By the end of the month the impact of abundant rain and reasonable light levels could be seen on the size of the grain which looks to be very promising indeed, and suddenly harvest doesn't feel far off at all.

Our Wheat trial field receiving its T3 in a break in the weather

OSR

A bit quiet on the OSR front this month, the crop is looking promising as the conditions have been good for pod development. The benefits of even establishment have been distinctly noticeable, with the whole field moving forward uniformly ready for the upcoming harvest.



'All together now!' - The OSR starting to turn

Spring Wheat

Spring wheat for us has been somewhat of a revelation in terms of management with a second pass of fungicide and micronutrition completed on the 18th of the month. The crop has remained clean throughout with only the odd rogeuable blackgrass plant which is a very welcome product of our system given the farm was infested with the weed prior to adopting strip tillage. Ear counts for this spring crop have been excellent and all in all makes for a very promising spring cropping option.

Spring Wheat is looking to be an increasingly attractive spring option for us

Spring Beans

June saw pod set well underway in the spring beans and flowering continues with the later sown bean crop looking well as a whole. The month began with a fungicide pass of Alto Elite combined with a micronutrient top up. This will be the last pass through beans on the farm using chlorothalonil, another safe and effective active ingredient soon to be lost in a crop in which it retains strong efficacy.

The rain later in June and relative warmth saw the first signs of chocolate spot. The sprayer was soon dispatched, with an evening application of signum. The clearance of our tractor mounted sprayer was certainly tested, particularly in the February sown fields which are displaying a marked difference in height to those sown a month later.

Testing out the clearance on the sprayer!

Winter Oats

The first harvest of the summer at Springfield Farms was our winter Oats into an OSR stubble cover crop. This had proved an excellent over winter grazing mixture for ewe lambs, who grazed the Oat and volunteer OSR back tight with the dual benefit of a PGR and removing diseased leaves. And certainly cheaper too, although on second thought perhaps not where sheep are concerned!

The temptation following excellent establishment at low seed rates was to take the crop through to harvest for grain. But with only pre-emergence control options for grass weeds and our policy of zero tolerance towards seed return, meant we opted for whole cropping at the beginning of June. And the right decision it turned out to be too with a bumper crop of quality silage as a result.

Not something we typically do but this winter Oats grazing mixture went on to become excellent silage

In the media – an article about the Mzuri system and our trial farm

Integrated approach to crop establishment gets best out of Mzuri strip-till drill

With pressures like slugs, black-grass and flea beetle to contend with, everyone knows getting a crop up and away in the autumn is critical, but not everyone knows this can be achieved in one-pass, straight behind the combine.

British manufacturer Mzuri has been championing just that, a strip tillage system that achieves quick, even establishment in a range of soil types – with none of the typical drawbacks of direct drilling.

Tackling many of the common pitfalls of direct establishment, the Mzuri system centres around two key pieces of equipment – the one-pass Pro-Til strip-till drill and the Rezult stubble rake. Designed and manufactured in the UK, the Mzuri system has been tried and tested on the company's trial farm in Worcestershire and has since seen excellent uptake across Britain, Europe and even as far afield as New Zealand and parts of Africa. The manufacturer puts the system's success down to its versatility and ability to establish a wide range of crops, in different soil types.

Strength to strength

Mzuri's trial farm manager, Ben Knight experienced this firsthand at Springfield Farm where he manages the manufacturer's trials alongside the commercial farming enterprise. "Since converting to strip tillage, crop establishment, Springfield Farm has gone from strength to strength," he says.

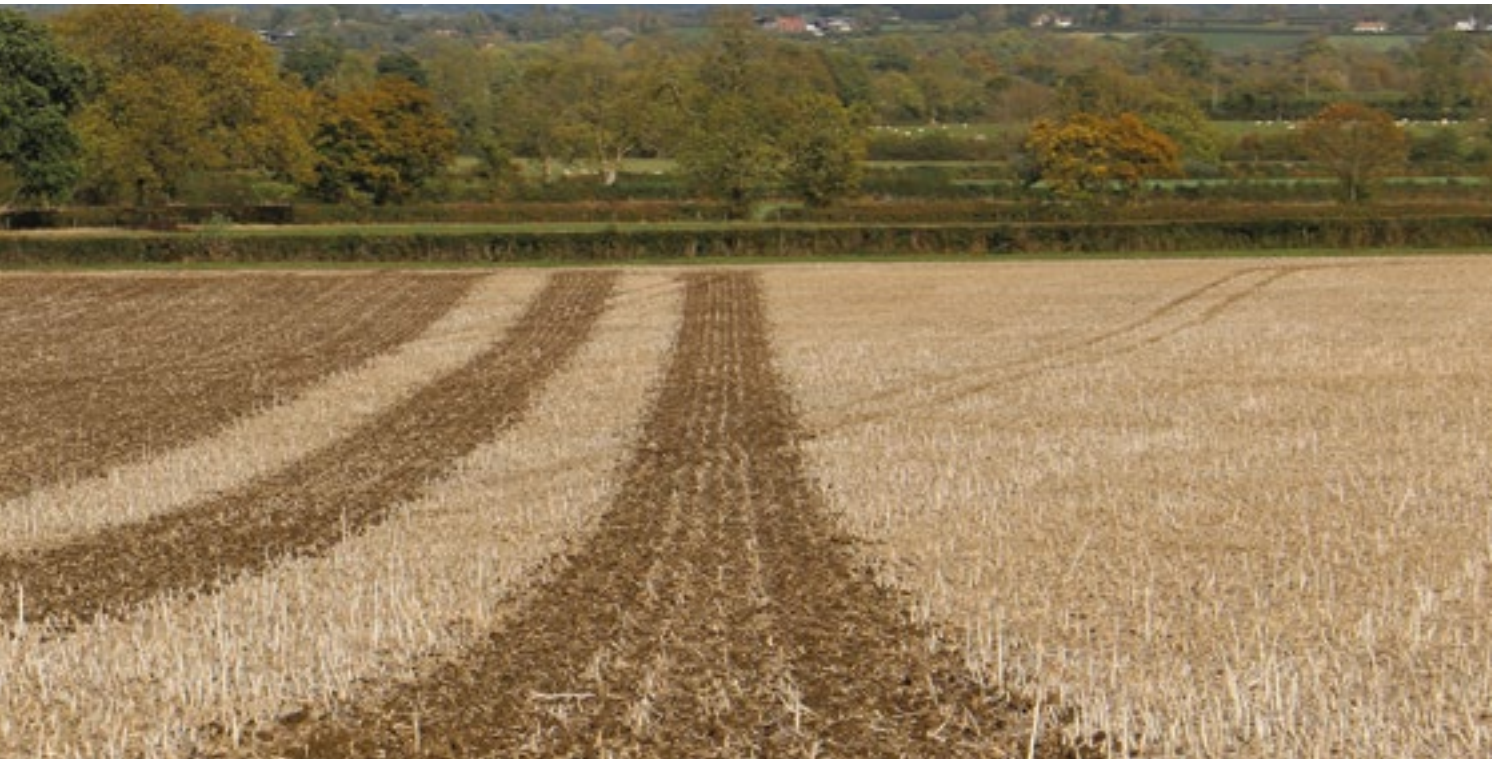
"By creating a shattering effect in a targeted zone the Pro-Til produces a fine tilth vital for good seed-to-soil contact, with nutrition and moisture easily accessible giving crops the optimum environment to germinate quickly and evenly."

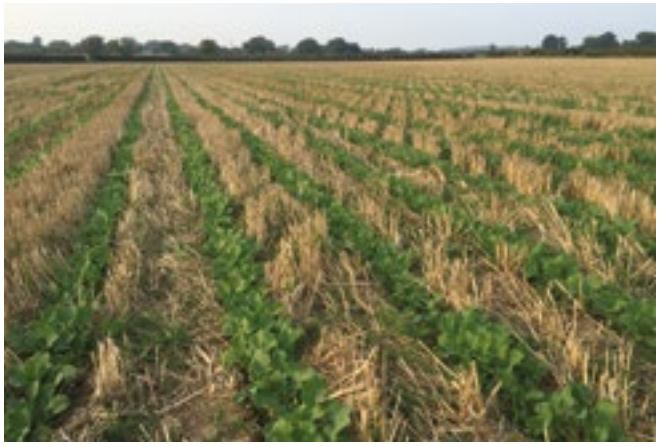
Designed to clear previous crop residue from the seeding zone, the Pro-Til's leading leg produces a clean strip of friable soil while mineralising nutrients. Ben Knight explains; "The action of the Pro-Til's front leg creates the perfect nursery seedbed in which to place the seed.

"It's important to ensure seed is placed into the centre of the tilled strip and at a consistent depth. The Pro-Til with its pivoting coulters, all individually hydraulically pressurised, follow the contours of the field and remain in-line with the leading legs even around tight headlands which means we achieve accurate seed placement across the whole field," he explains.

Even establishment of oilseed rape gives the crop the best chance against pests.

"In one pass, the drill reconsolidates the soil firmly around the seed in two stages, improving seed-to-soil contact further and providing protection from pests.





"Another key component of the Mzuri system that makes it so successful on this farm and many others, is its ability to promote even establishment of crops like oilseed rape. In situations where flea beetle are present, the even emergence of the plants means predation is spread evenly, causing less feeding pressure than when plants emerge one by one through uneven seeding depth. The crop is also in a much better condition to grow away from any damage quickly thanks to moisture retention and access to mineralised nitrogen at drilling."

Further generating rapid, early growth, the Mzuri system advocates band placing fertiliser below the seeding zone to improve efficacy and availability. Mr Knight has found that by applying fertiliser with the Pro-Til's leading leg below the seed, there is less reliance on rainfall to break down the product, instead it's placed directly into moisture, right where the new plants are going to need it."

Targeted cultivation

Ben Knight suggests that modern agricultural practices have had an increasingly detrimental effect on soil health from continuous over cultivation and by not replenishing lost nutrients.

"Soils high in organic matter are more resilient to machinery traffic and are better able to absorb and retain soil moisture. High levels of organic matter can lead to acidification of the soil over time but the Mzuri system gives us the ability to achieve both high organic matter levels and aerated soils.

"By only cultivating in bands we can clear crop residue from the seeding area, allow oxygen into the profile, while leaving the strips between undisturbed, thereby retaining their nutrition and structure for later in the season," he adds.

It is this targeted tillage that the manufacturer attributes the Pro-Til's success in improving degraded soils as part of the wider system. By concentrating the cultivation within carefully placed bands, it's possible to achieve all the benefits of a cultivated soil while also retaining the structure needed for root development and the weight resistance that would more often be associated with a min-till system.

The natural architecture of oilseed rape suits the wider 66cm rows.

Wider rotation

As part of an integrated approach to soil health, Mzuri encourages its users to adopt a wider rotation, including cover crops where possible, prior to spring cropping. At Springfield Farm, Ben Knight has been incorporating cover crops into his rotation for a number of years and has seen the benefits stack up.

"By providing the perfect environment for crops to thrive, we benefit from the work the crop's roots do throughout the soil profile. We use cover crops including tillage radish, oats and vetches and try to have a growing plant in the ground for as much of the year as possible. Not only does this harvest as much sunlight as it can, but it also means there is a root structure that penetrates the lower levels of the soil profile which allows water to infiltrate, supports biodiversity and binds the soil aggregates together – particularly important over winter."

A common establishment pitfall can be a lack of moisture at drilling, either due to prior heavy cultivations or as a result of a rain deficit. Users of the Mzuri strip tillage system will know the manufacturer suggests leaving crop residue on the surface, creating a protective layer of 'thatch', preventing moisture loss.

"Moisture at planting is key to quick establishment but also to support the crop going forward," continues Mr Knight. "Managing our crop residue has been one of the single biggest factors in improving our cropping, particularly oilseed rape where early moisture can be critical.

"We chop the straw behind the combine and leave the stubble long. Not only does this have the effect of encouraging the seedlings on, but the layer of thatch retains moisture. We haven't seen an increase in slugs with this method or had a problem with crops breaking through the layer.

"And the long stubble helps to keep pigeons off which is always a bonus."

In situations where the straw must be taken off, particularly in mixed enterprises, Mzuri suggests that returning muck can be a good alternative. Left on the surface, deep working earthworms will drag the matter down where the soil biology can degrade it effectively, releasing nutrients for the growing crop.

Mr Knight has found that leaving the previous crop residue on the surface has taken the risk out of spring cropping. "The only thing predictable about weather patterns is their unpredictability, so establishing a spring crop can be seen as too high risk for many to view as a viable option.

"Since expanding our rotation, we have required more spring crops. By supporting a soil structure that can let water infiltrate when wet and a protective layer of residue to retain moisture when it comes dry, we are effectively taking the risk out of our spring crops. The direct nature of the drill also means we can get seed in and established quickly and come spring or winter, crops are thriving as a result."

Row widths

The Pro-Til boasts two row width options of 33 and 66cm. Mzuri says that 33cm proves popular with cereal establishment whereas the 66cm wide row suits oilseed rape.

"Part of the system is to maximise the amount of light into the lower levels of the crop," says Mr Knight. "The leaf of the plant is a natural solar panel and needs space to take in as much light as possible throughout the day.

"The band placement of seed, especially cereals, allows greater light interception through the depth of the canopy. While the flag leaf is considered the most vital for yield for a wheat plant, the lower leaves continue to aid photosynthesis and contribute sugars to ears and grain."

Single and double coulter options can be used to adjust the spacings between rows further, allowing for even greater flexibility.

Wider rows have also shown less disease throughout the season, explains Mr Knight. "Increasing the distance between crop rows not only supports higher yields but also aids the movement of air throughout the plants helping to keep the lower leaves and stem bases well ventilated which can reduce the incidence of mildew and eyespot which occur more frequently in humid conditions.

"However, increasing the spacing between plants goes beyond light interception and micro climates. In OSR, reducing interplant competition means that the plants have space to branch earlier without bolting for sunlight. This process helps to increase yield through a reduction in apical dominance and a more stable canopy because much of the branching occurs earlier and reducing the stress of a tall, leggy stem.

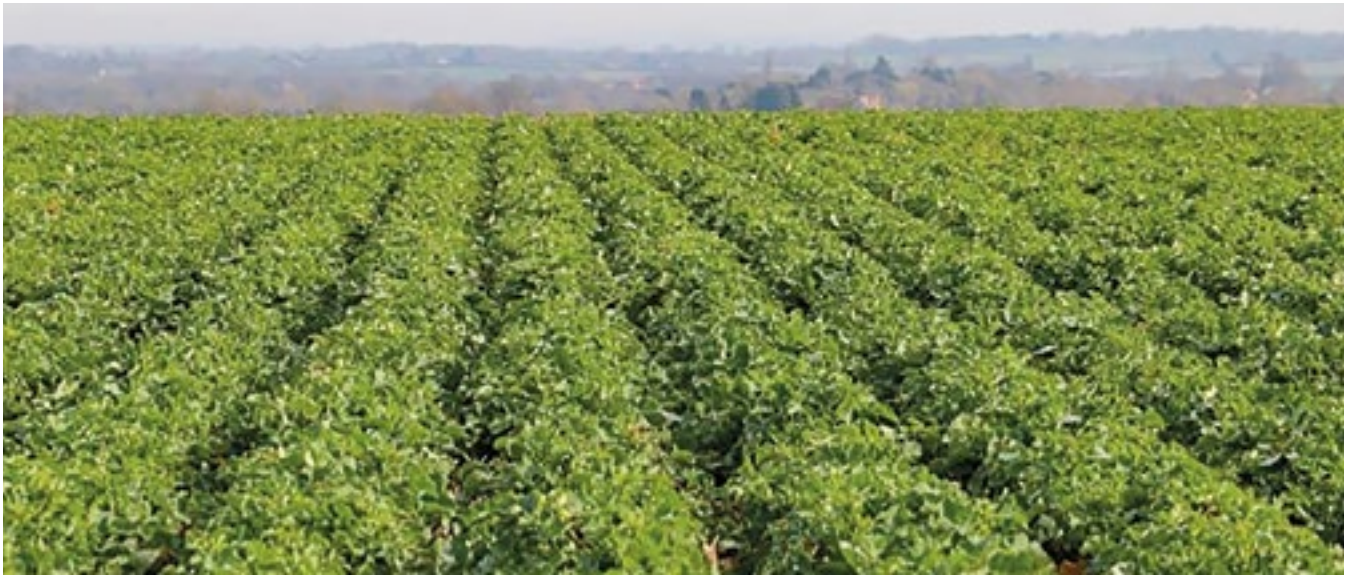
"Trials at Springfield Farm have shown that when compared with standard 33cm rows, our OSR drilled on 66cm row spacing is significantly less likely to lodge and also achieves an uplift in yield. By managing light interception, we are able to produce strong, healthy plants with more pods and carry them through to harvest."

Pest and weed pressure

The Mzuri strip tillage system isn't complete without the Rezult stubble rake, points out the company. A staple on the manufacturer's trial farm, the implement is a major tool in Mr Knight's arsenal against slugs and weed pressure.

"By using the rake as a cultural control method, we are actively reducing slug populations ahead of sowing by breaking the life cycle at the first stage. The heavy-duty tines destroy slug habitats while bringing eggs to the surface where they are exposed and baked in the heat of the day.

"By not inverting the soil, we keep any weed burden on the surface rather than mixing it through the profile where we would likely experience multiple emergences. Using the rake fitted with front discs we can generate sufficient tilth to achieve a flush of weeds which can be effectively managed in one go with the sprayer."



July Crop Update

6th August 2019

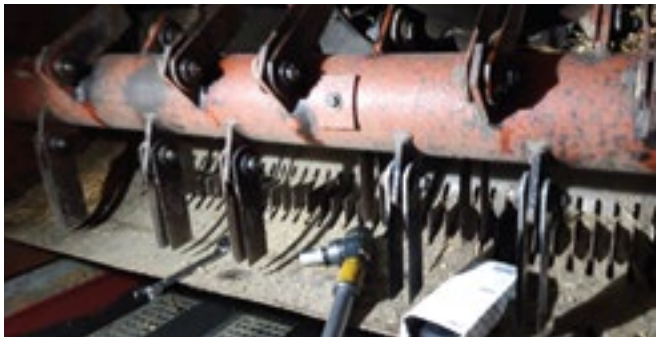
Winter Oilseed Rape

With harvest now imminent the final preparations were made and with volunteers suddenly thin on the ground I donned my dust mask to give the grain stores a final clean down. I guess the thought is always worse than the action, but with a satisfyingly smart end result I can't help but look forward to filling them with this year's crop!

Continuing with the theme of harvest prep, the trailers were cleaned, and the combine's side knife was fitted alongside its general servicing. It doesn't take long to get to the point where it seems like there is nothing left on the farm to either grease, oil or fuel up.

My eagerness to see whether the crops promise would deliver over the weighbridge was sated on 24th July when we began harvesting our hybrid variety DK Expedient. A thunderstorm coupled with 9mm of rain the evening before made combining a dusty affair, a pattern that continued with odd showers right through to the end of the month. The following day saw the hottest day of the year so far with temperatures hitting 33˚c, days that certainly make you thankful to be farming at a time of cabs and air conditioning! With temperatures at 22˚c by 8am harvest was stopped by lunch as the moisture dropped below 6%. With limited space on farm this year we didn't want to be hanging on to the crop for too long so air was swiftly blown through the heap to take the temperature out ready to be sold.

Pods were well set and harvest was one of the hottest we've had!



The combine got her fair share of tlc this year too!

We wrapped up the OSR harvest by the end of the month, having been particularly stop start at times. Our average yield of 4.2t/ha fell short of expectation based on our 5 year average, nonetheless given the CSFB pressure OSR remains a profitable break crop on the farm due to the almost guaranteed establishment of the Mzuri system, something that we never take a risk on.

In preparation for harvest the headland margins were topped providing a 1.2 metre clean swath for the combine to cut to. Allowing me a final look at the crops before the combine is the next machine in the field it'll be all systems go soon!

Winter Wheat

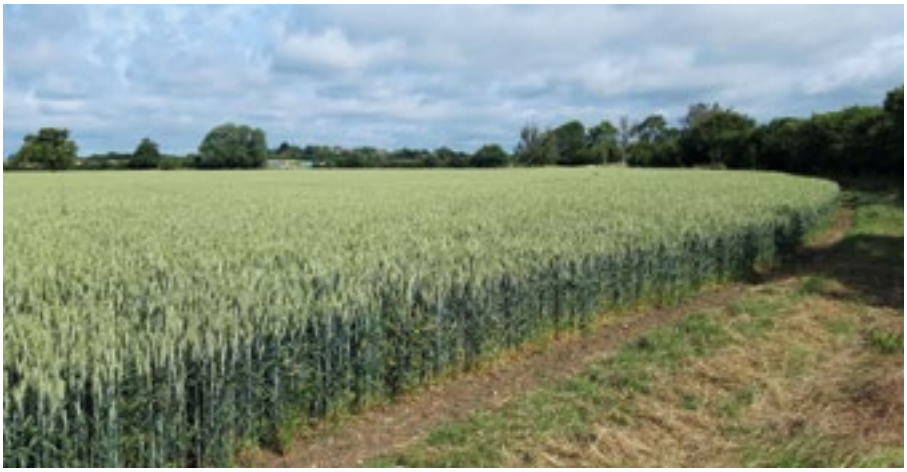
July tends to be a waiting game with winter wheat as we edge closer to harvest. But keen to capture all the information that we can, to then tally with yields I set about collecting ears, along with noting counts and measurements. A total of 7 different winter wheat varieties are being grown on the farm this year, along with trials looking at seed rates. Hopefully, this will prove to give interesting insights into each plots yield components and how we might then build on these trials going forward.

By the middle of the month the crop seemed at a flick of a switch to noticeably ripen, as another cropping season draws to close. In preparation for harvest headland margins were topped providing a 1.2 metre clean swath for the combine to cut to. Allowing me a final look at the crops before the combine is the next machine in the field it'll be all systems go soon!

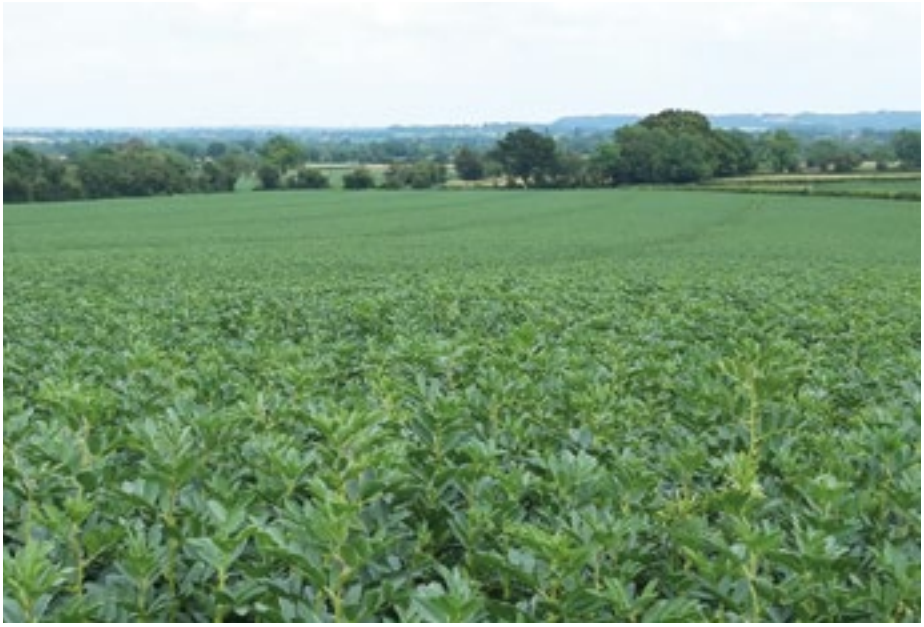
It won't be long before the winter wheat will be coming into the shed.

Spring Wheat

The rain received in June is paying dividends with the spring wheat, and grains continue to swell hinting at what I hope will be a good bushel weight. With Cochise being one of the tallest varieties on the list it's proving to be a good test of straw strength as the ears grow heavier. The crop was sown using the Mzuri Pro-Til dual shoot coulter on 330mm centres, this spacing ensures excellent light interception which in part results in a stronger, healthier straw, helping to maintain a standing crop particularly important in a variety that offers milling quality.



Cochise spring wheat is standing tall with its strong straw, and clear headlands ready for the combine to boot!



Lynx Spring Beans taken on the 16th July, looking even across the field

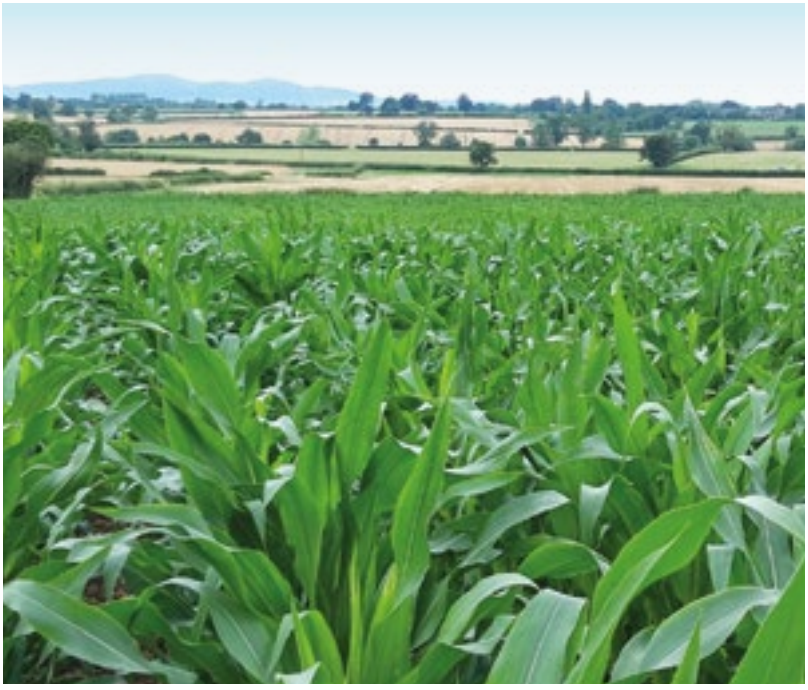
Spring Beans

Our crop of spring beans continues to progress well, despite a testing time in terms of wind and rain. The variety Lynx chosen for its robust disease and standing scores (as well as yield!), is certainly showing its agronomic worth. Remaining clean the crop is standing well even with a heavy pod set.

Maize

Our late May sown maize emerged evenly after benefiting from the band placement fertiliser from the Pro-Til's leading leg, however the rain and cool overnight temperatures weren't exactly the June conditions to enable this warm season crop to romp away as we'd normally expect. A foliar nutrient application certainly made me feel better in terms of helping the crop along and would seem to have a similar response from the crop as growth had noticeably kicked in by the end of the month. I also applied for the first time Maister to clean up some thistles and the occasional grass weed, whilst arguably a little extravagant on crop destined for wildlife, its achieved fantastic control, a useful tool still.

July saw the maize motor, underlining the crops ability to convert heat into growth. The crop had plenty of moisture during its rapid growth development thanks to the strong rooting promoted from the Mzuri system and by the end of the month the crop stood tall with excellent cobs.



Maize by mid July

Local Hay exchange

30th August 2019

Locally, a 'hay exchange' group has been established by Worcestershire Wildlife Trust set to create a network of donor and recipient meadows to help maintain and enrich meadows in the area. Springfield Farm is fortunate enough to have some important flower rich meadows amongst our arable fields so in July these were baled, providing a handful of bales for a neighbouring traditional orchard. A group of keen volunteers distributed the hay across the grassland, which will be grazed by sheep, putting the golden hoof to use helping the seeds to strike. We look forward to monitoring how successful the method is in forthcoming years.

66cm row spacing - double shoot coulter

Oilseed Rape Harvest 2019

9th August 2019

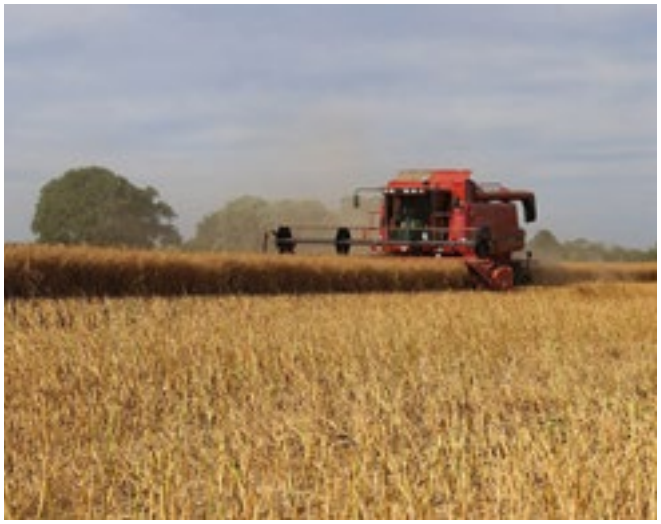
Our Oilseed Rape harvest began on the 24th July, over 2 weeks later than last year's extraordinary harvest campaign. This year's sample has been excellent, both even in maturity and bold – something we put down to allowing the crop to ripen naturally. Typically, our crop also ripens earlier than most crops in the local area and do so very consistently.

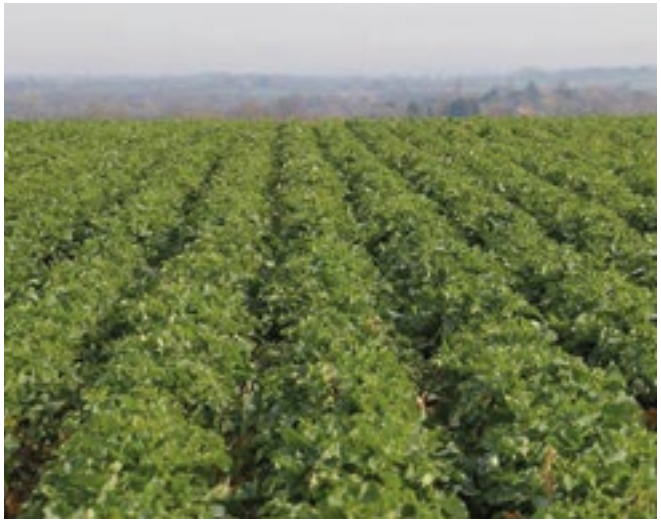
It's been quite clear that the crop benefited from the plentiful rain received in June but with an average yield of 4.2t/ha we were a little disappointed given our previous averages of 5t/ha. However, on closer inspection of our stubbles I had underestimated the damage that CSFB larvae had inflicted on the main stem, and subsequent restrictions to nutrient flow. Given the pressures to the crop I am pleased to have achieved a figure above our averages pre-strip tillage and no doubt had the crop have not gotten off to such a good start the situation could be quite different!

In our trial field which looked at hybrid and conventional varieties, along with different row spacing the trials displayed interesting comparisons once again. The early maturity of the hybrid variety DK Expedient was most evident in the stem at harvest, made more pronounced by not desiccating. Despite this I was surprised to see that the two types only varied in seed moisture by 1% on the same day of combining.

One thing that undoubtedly stands out from previous harvests is the adult CSFB pressure. I've heard accounts from around the country of grain stores with more live specimens than seed, and this trend has been evident on our own farm with the content of trailers and grain store a little more 'mobile' than I'm used to seeing!

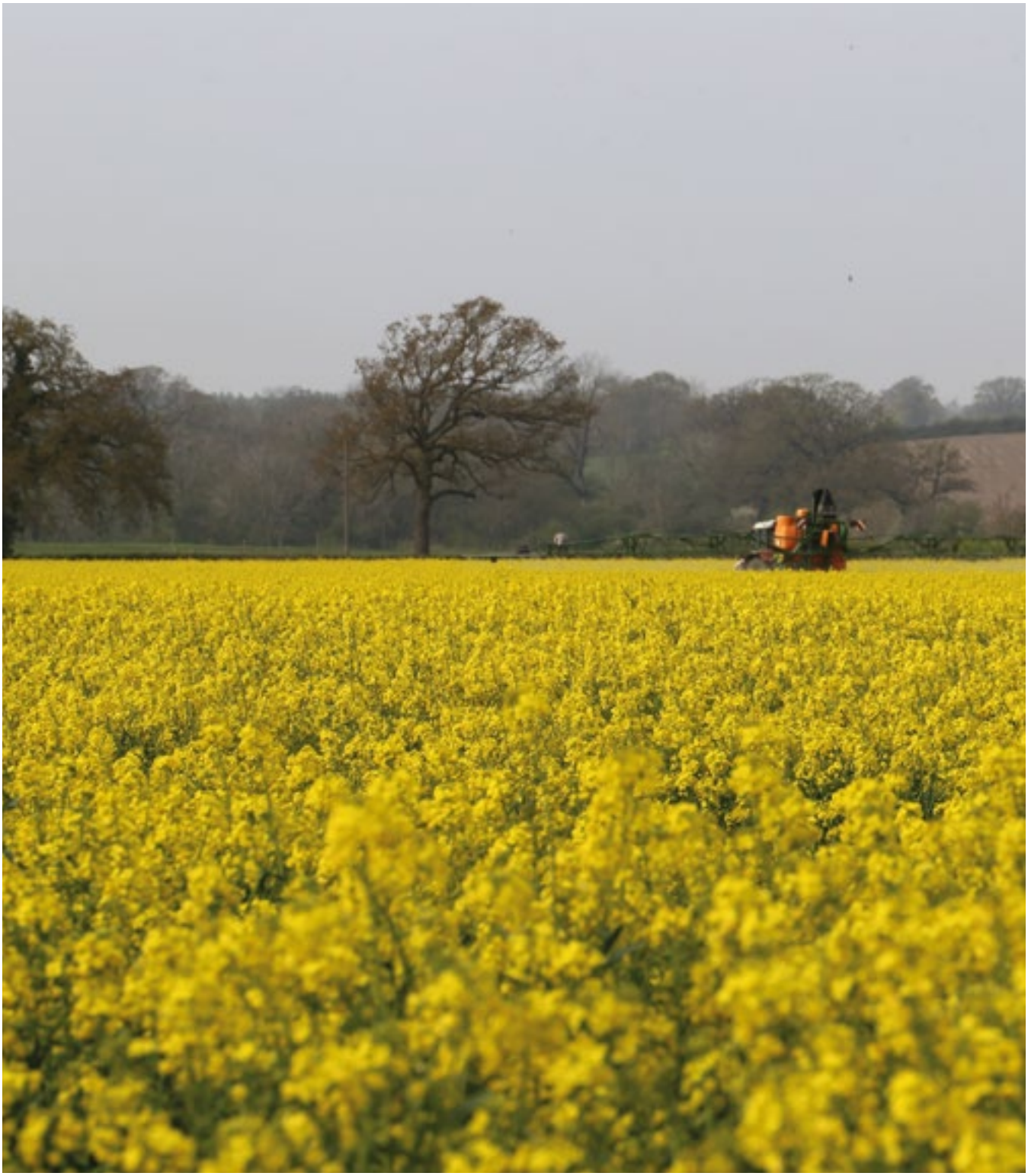
This brings back to the fore – last autumn where the number of crops written off in the local area due to dry seedbeds, combined with CSFB pressure was particularly high. At this time, the Pro-Til one pass system we employed





on our farm ensured precious moisture was retained, which when coupled with band placement fertiliser enabled our crop to make it through the vulnerable early stages to provide an even, strong stand.

The corner to corner establishment across our cropping area, meant my winter wasn't spent chasing pigeons in the cold and rain, and whilst often seen as a nuisance – the real cost of that winter occupation in terms of time, deterrents and loss can be significant. I'm pleased to say we didn't lose a single acre, which combined with low cost establishment, OSR has remained a profitable break crop on this farm and long may it continue!

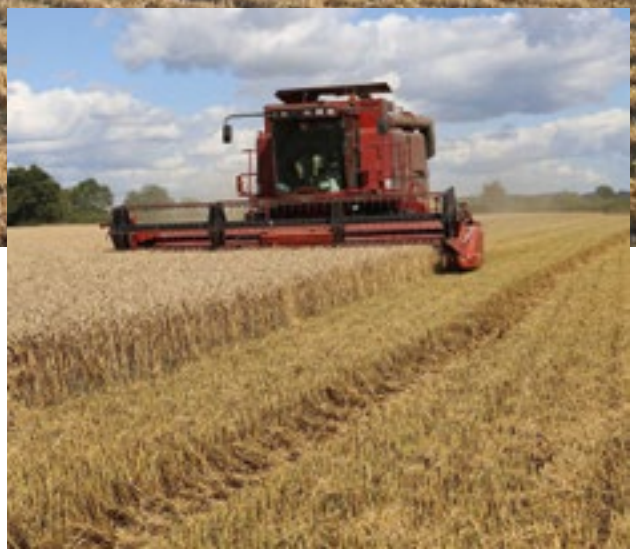


Winter Wheat Harvest Update

21st September 2019

66cm row spaced Costello went on to yield at 80% of the farm average, pretty good for rows double the distance apart

Our winter wheat harvest began on 12th August with our earliest variety Graham. With Martin in the combine seat feedback was good and with the grain threshing well, it was soon becoming evident there was a big crop here. However, like every farming story, it wasn't all good news!



The unmistakable strip tilled rows visible as the stubble is cut

The air conditioning had decided to pack up and with the recent bouts of rain the combine was often lost to dust, so doors could only be opened when the wind was in the right direction. Fortunately, our local Case dealer James Green came to the rescue, re-gassing the system and a walk out was averted!

The dryer, after having had last summer off, was called back into action to dry approximately 30% of this year's grain. With 70mm of rainfall during the month, it certainly made for a stop start harvest.

Variety Graham

The use of an extra 18 tonne trailer certainly proved its worth as we harvested the furthest block on the farm, it was a 'just in time' system with myself on the corn cart arriving back in the field to a full trailer. The three fields of Graham averaged 12.1t/ha, with the best field topping 12.4t/ha. It was a very promising start to our wheat harvest and taking the time post combining, it was clear to see by looking at the stubbles, how well the crop had tillered – promoted by the Mzuri Pro-Til row spacing.

1ha trial plots – Hybrid vs Conventional seed rate trials

Next up were the first set of 1 hectare trial plots. Beginning with a late September drilled trial using the conventional variety Costello, three different seed rates were applied from the farm standard rate of 320 seed/m^2, to as low as 160 seeds/m^2. The highest yielding Costello seed rate at 12.3t/ha was the 240 seeds/m^2 plot, followed by the 160 seeds/m^2 at 11.56t/ha and the 320 seeds/m^2 at 11.09t/ha – an interesting comparison

Alongside this we had the hybrid variety Hyclick, grown for the second year at Springfield Farm, after displaying interesting traits in its first year. Applying what we had learnt, seed rates ranged from 80 seeds/m^2 through to 160 seeds/m^2. These plots went on to yield 11.65t/ha at 100seeds/m^2, 11/11t/ha at 160seeds/m^2 and 10.84t/ha at 80 seeds/m^2.

The hybrid trial was replicated in a second trial field, where 100 seeds/m^2 went on to yield 12.51t/ha – this was coupled with a first look at new hybrid varieties coming through from the breeder Saaten Union. Out of five hybrid varieties trialled, all at 80 seeds/m^2 Hyclick yielded the highest but all of the varieties were within the 10-11t/ha region.

Glyphosate Free Field

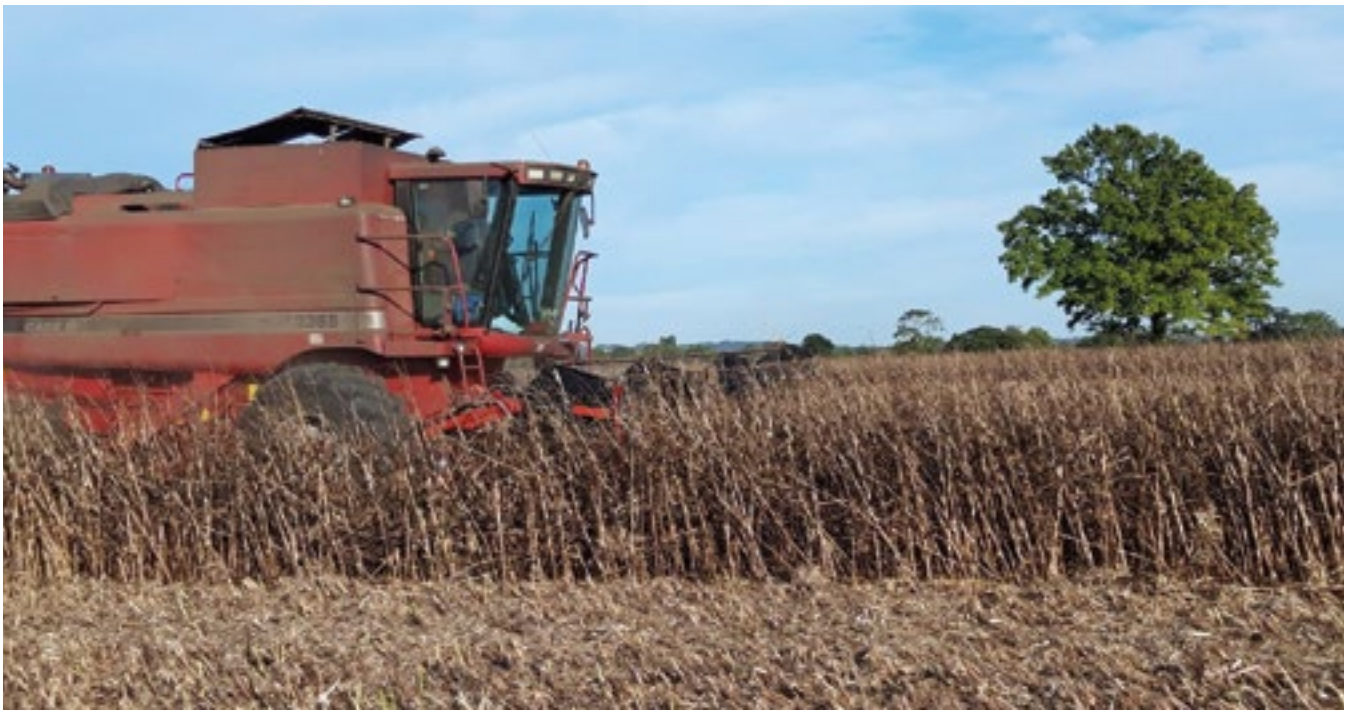
Our glyphosate free field achieved a very pleasing 11.5t/ha. This field, which was sown using diquat on a stale seedbed, remained largely very clean with only an hour spent hand rogueing the odd blackgrass plant. The field will be drilled in the Autumn East-West to aid inter row shading of weeds.

66cm row spaced Costello

An excellent wheat harvest was capped off by our last field of Costello on 24th August – sown using the wide row spacing of 660mm using a double shoot coulter. With only effectively half the field sown, the crop went on the yield 9.58t/ha, which stood at 80% of the farm's average yield. I was really impressed with this and underlines the importance of sunlight interception and when given the space, plants will tiller well making the most of the space and light made available to them.

Harvest Log: Spring Beans

25th September 2019



Harvest 2019 at Springfield Farms was completed with our crop of spring beans. Luckily, I'm not a superstitious person as combining began on Friday 13th, finishing up without mishap on Sunday 15th September. Conditions were ideal, with temperatures in the early twenties and a fit crop that went straight into store without requiring drying. Spring beans were a change to legume break cropping, following two years of growing Soya. And to my delight, harvest arrived over a fortnight earlier than the previous crop of Soya, even when compared to the exceptionally dry year of 2018.

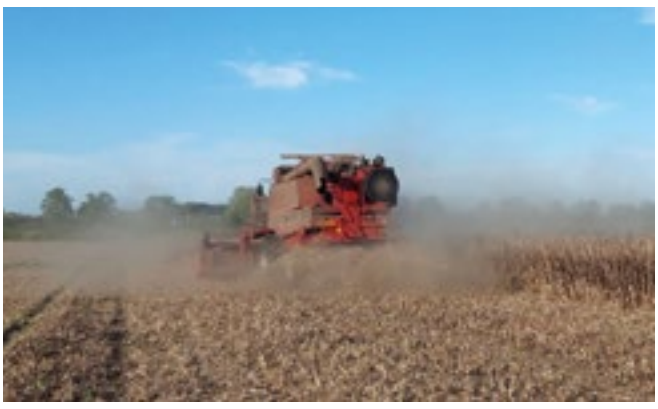
Sowing had been a two-part campaign, with roughly half the area sown at the end of February and the second half at the end of March. Beginning harvest with the earliest area, first impressions as we took the headland off were favourable. As the final load from the first field drew near, anticipation had built, with the weighbridge running total already well beyond my expectations. The final trailer was swiftly dispatched back to the yard to be weighed off. The total came to 45.87 tonne from 7.6 ha, giving a yield of 6.0 t/ha. A fantastic result, with the second February sown field achieving 5.8 t/ha.

The remaining 22 hectares of Beans were sown at the end of March, following rain. The yield averaged 4.2t/ha, which would normally be a respectable tonnage for Spring Beans. Ten hectares of the late sowing was a field where our cover crop termination differed from our normal farm standard. As discussed in an earlier diary entry one half was grazed off, the second frost rolled. Interestingly, both halves yielded the same with the increased nutrient availability seen with the sheep grazing not being as pronounced with a legume crop as it had been with the Spring Wheat.

Ultimately, both methods succeeded in presenting the biomass back to soil ready for our worm population to play their part, creating textbook conditions for sowing.

Whilst it's not every February we will have the conditions witnessed this year; the two drill dates certainly made for an interesting comparison. The unusually dry winter encouraged particularly strong early rooting as they went in search of moisture during February, which as the season progressed supported a markedly taller plant. Plant heights were recorded for the two sowing dates, the earlier sowing averaged 151cm, some 40cm taller than the March beans. The additional height most importantly provided additional light interception, with pod height remaining broadly similar albeit with more productive pods overall. Weed control was also more effective in the earlier sowing, aided by rainfall through early-mid March.

In all its been a very pleasing return to growing spring beans at Springfield Farm, best of all our soils are in fantastic condition complete with carry over nitrogen ready for wheat.



Reflecting on the year – A season of trials

As you would expect from a farming diary, weather is usually the first topic for discussion!

A dry weather pattern dominated for much of the year, from late spring 2018 right through to the beginning of June 2019. Now in its 9th year, this proved to be a good test for our strip tillage system which, I'm happy to report, passed with flying colours and resulted in another season of excellent yields. For me this really is the proof that coming back to the fundamentals of healthy soils and ensuring moisture retention at sowing, areas in which the Mzuri Pro-Til excels, is the key to a resilient system for all seasons.

At Springfield Farms, alongside focusing on the health of our arable plants and soils, we ensure the wider farm environment receives plenty of attention too. During the winter we planted over 200 hundred trees, along with new hedgerows and general gapping up around the farm. These are the jobs that I derive a lot of satisfaction from and feel they complement the long-term outlook of farming, and our care for the environment – and of course keep me active with a spade!

With operating a direct drilling system, cover crop termination is an important topic for us and it's an area we've run trials on this year. Possibly my favourite part of the trial was the cause to bring livestock back on our arable fields. Deployed primarily to graze our oat and volunteer OSR mixture as a means of destroying the crop pre-drilling we also turned the ewe lambs out onto our radishes which they happily munched off also! Not just a pretty picture, the biggest benefit I felt was seen ahead of spring wheat, where a strong stand of oats was reduced to pellets in short order. The finished effect was perfect, particularly given oats which are often hailed for their competitive nature when combating grass weeds, can see this same positive trait negatively impact upon a subsequent cereal crop.

Grazing was made possible using the Mzuri strip till system, whereby over half of the soil remains undisturbed, enabling the weight of the animal to be carried without damaging topsoil in harsh winter conditions. The plant material, rich in nutrients, is then made immediately available to the following spring wheat crop, whereas typically they would be released in a much slower manner. I believe it was this combination that aided our spring wheat to deliver a superb yield, having looked strong and healthy throughout its growing season.

For the second year running we've been testing hybrid wheats at the farm, a crop which is still very much in its infancy commercially, and we have been lucky enough to secure new material from the breeder Saaten Union. This has enabled us to draw comparisons between hybrid and conventional varieties at different seed rates, whilst observing and measuring the performance of new varieties. Despite very low seed rates, yields of up 12.5t/ha were achieved. This I feel underlines how well the Mzuri ProTil strip tillage system and hybrid wheats dovetail. Through creating a consistent nursery seedbed, that ensures each seed is accurately placed to capitalise on the ideal growing conditions, supported by the space to tiller and maximise light interception, hybrid varieties can reach their full potential. Even when sown at such low seed rates the hybrid wheats displayed a seemingly allelopathic effect on grass weeds, reinforcing the need to investigate this innovative breeding further, as it offers a great deal of potential when grown under our approach to establishment and soil health.

Looking forward – The start of a new season

The upcoming season will see an extended programme of trials at Springfield Farms. Putting to the test eight varieties of oilseed rape, each with distinct traits offering economic benefits to the grower. Especially of interest are tolerances to infections such as Turnip Yellow Virus, eliminating the potential need for an autumn insecticide, which is likely to be more detrimental to our beneficial insects than the target aphid. We will also see a continuation of our hybrid wheat trials, building up a picture of their performance through different growing seasons, and where we can take them next.

With an eye to the future we have established our third crop glyphosate free, this time winter OSR which was sown directly into wheat stubbles as the combine left the field. This provides a useful opportunity to manage background grass weed populations, as part of our 4 year rotation. In another field, a four legume inter row understory has been established, with winter wheat to be sown 4-6 weeks afterwards. As we seek to learn how our cash crops can be grown with a permanent legume understory and how this might benefit our approach to nitrogen and weed management going forward.

British farming is in a period of major change, economically, but also in terms of the depleting chemistry toolbox at our disposal. Now more than ever we as farmers need to be focusing on soil health and its management. This presents many opportunities by making individual businesses more resilient, through soils better able to cope with changing weather patterns and by supporting healthier plants with less requirement for synthetic inputs. All of which comes back to the cornerstone of any arable system, which is consistency of establishment, ensuring soil biology and farm businesses thrive as a result.

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Ben Knight
Farm Manager

Farm Trial results

Conventional Hybrid

Field 15 Seed Rate Trials

Drilling Date: 19/9/18

Variety	Seeds/ m²	Height (cm)	Tillers/ m²	Ear Count/ m²	Ear Length (cm)	Weight per 10 ears (g)	Grains per ear	Kg/ HL	Yield (t/ha)
Costello	320	87	1392	667	8.2	27	47	78	**11.09**
Costello	240	86	1380	696	9.5	33	49	79	**12.30**
Costello	160	86	1212	612	8.7	37	67	79	**11.56**
Hyclick	160	88	906	564	7.8	34	57	76	**11.11**
Hyclick	120	87	751	557	9	36	54	76	*
Hyclick	100	94	648	557	9.5	42	66	76	**11.65**
Hyclick	80	89	696	565	10.5	36	71	76	**10.84**
Average	177	88	1039	610	9	35	60	77	**11.43**

A clear finding from our trial has been the difference in tiller survival between conventional and hybrid wheats. The conventional variety Costello ultimately producing ears from only 50% of the earlier tiller numbers, whereas the hybrid is producing from 75%, suggesting a much more robust plant. Although as a grower, both results signify more potential to be had. Another set of figures which stood out were the ear length and grains per ear from populations at lower seed rates. This supports our view that given more space and light, an individual plant can better fulfil its genetic potential.

Field 13 Hybrid Seed Rate Trial

Drilling Date: 03/10/2019

Variety	Seeds/ M²	Yield t/ha
Hyclick	160	11.96
Hyclick	120	11.17
Hyclick	100	12.51
Hyclick	80	11.66
	Average	11.83

This harvest concludes our 2nd season of growing hybrid wheats, with a particular focus on optimum seed rates. This year saw an increased range of rates, with the optimum for both of our trial fields of 100 seeds/m2 (53kg/ha) proving to deliver the best yield, striking the balance between number of ears and yield delivering components of each ear.

Field 13 Hybrid Wheat Variety Assessment

Drilling Date: 03/10/2019

Variety	Seeds/ m²	Height (cm)	Tillers/ m²	Ear Count/ m²	Ear Length (cm)	Weight per 10 ears (g)	Grains per ear	Kg/ HL	Yield (t/ha)
Hyclick (c)	80	89	848	515	10.5	36	71	76	**11.66**
Hyena	80	97	864	545	9.3	44	79	76	**10.68**
Hyking	80	84	721	480	9.5	33	59	75	**10.7**
Hymalaya	80	96	735	535	12	43	81	77	**10.92**
Hynvictus	80	84	691	460	11.5	40	60	75	**10.13**
Average	90	772	507	11	39	70	76		**11.43**

This trial looked at the wider portfolio of hybrid varieties by Saaten Union. Hyclick ultimately delivered the highest yield, although all delivered respectable numbers, with each offering other positives to growers by means of growth habit and physical attributes.

Field 15 Winter Oilseed Rape Row Spacing Trial

Drilling Date: 03/10/2019

Variety	Seeds/ M²	Row Spacing (cm)	Yield t/ha
Campus	70	66	**4.62**
Campus	70	33	**4.56**
DK Expedient	50	66	**4.71**
DK Expedient	50	33	**4.60**
		Average	**4.62**

Our trial comparing hybrid and conventional OSR varieties at different row spacings, supported our view of wider row spacing delivering a more optimum plant architecture for yield. Although the two spacings are within a couple of percentage in terms of yield. Interestingly, the yield difference between Campus and DK Expedient was negligible, although from a growers perspective Expedient required less day to day management.

Springfield Farms

Profitable farming that doesn't cost the earth

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