



Farm Diary 2019/20

An introduction from the Farm Manager

"Welcome back to the latest edition of our Springfield Farm Dairy.

You could be forgiven for not wanting to recap this farming year, it has certainly been a testing one in many ways. From record breaking swings of rainfall and floods, to drought and seemingly endless sunshine, this farming year saw both ends of the spectrum. Our focus upon increasing the resilience of our Evesham Lias clay soil type has paid dividends, as seasonal weather patterns become more extreme and wholly less predictable in nature.

And whilst our winter wheat area was down, as the wellworn phrase 'the forecast looks better next week' never did materialise - our soils protected by cover crops, chopped crop residues as well as long stubbles withstood all that the winter had to throw at them with flying colours. Testament to what protection of the topsoil can deliver, coupled with keeping the soils structural integrity intact through strip tillage, our soils percolated the water away from its surface.

When spring arrived our soils rather than being slumped and saturated, were alive with worms busy processing cover crop residues, serving also to the build upon the crumb that had been sheltered throughout the worst of the weather. In effect the ideal spring seedbed, which when combined with the Mzuri Pro-Til system proved to be a successful partnership.

I hope you enjoy reading the 2019/2020 print edition of our diary and 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



Ben Knight manages the commercial arable enterprise at Springfield Farm as well as hosting multiple trials into Mzuri strip tillage and partnering with industry bodies.

Kicking off with Cover Crops

25th August 2019

This year we've made changes to our cover crop mixture, which had previously been based upon tillage and fodder radish. In part, this change has been buoyed by the success of last year's experiment of oats into volunteer OSR as a grazing mixture. I've been keen to add a greater number of species, for both diversity as part of the wider rotation but also for how they interact with the soil. The new mixture comprises of oats, vetch, phacelia and sunflowers, sown at 47kg/ha.

Drilling began on the 21st, with soil moisture replenished just ahead of drilling and then retained with the single pass of the Mzuri Pro-Til. The crop was quick to emerge, particularly the phacelia which was up in a matter of days, with the rest of the species following shortly behind. Sitting just below the seed, DAP was band placed at 120kg/ha via the Mzuri Pro-Til's leading leg – this ensured that early nutrition is readily available to maximise biomass whilst soil temperatures and day length support growth.



With a reasonably protracted wheat harvest a quick turnaround was required to establish our harvest 2020 crop of oilseed rape. R & T Liming did a fantastic job of being with us as the combine left the field to get our variable rate lime spread, with the drill following in quick succession.

In a last hurrah of summer, the sun shone as the bank holiday weekend was spent sowing OSR. All of our OSR was established sowing inter-row of the previous wheat crop stubble cut to 8 inches, with the remainder of the straw chopped and left on the surface. The thinking behind a taller stubble combined with chopped straw is to help mask the emerging plant at its most vulnerable stage, and when the flea beetle does arrive, their movement will be impeded to an extent.

Whilst not a total solution, this approach I hope will provide a small incremental reduction of the damage. This in conjunction with the Mzuri one pass system which accurately places the seeds into a nursery seedbed, retaining moisture, and reconsolidating whilst placing fertiliser and slug pellets, that get to work immediately will give our crop the best fighting chance.

As part of our experimental approach we utilise the two different row widths offered by the Mzuri Pro-Til 3T at 330mm and 660mm centres and sow using the dual shoot coulter. We have conventional and hybrid plots using both configurations, helping to build a year on year understanding as each season offers up something different.

We have also sown a 10ha field which contains a total of eight different varieties. My skills of cleaning down and calibration were quite impressive by the end, and all done in the blazing heat – I certainly felt like I had earnt a cold beer that evening! Each variety majors on different traits, so it should hopefully provide interesting comparisons to share as the season progresses.



By the time I had finished the variety trials I had become a dab hand at guickly cleaning down and calibration!





Kept under wraps! Our oilseed rape germinates nicely within the stubble for quick and even establishment.

Oilseed Rape moves on

30th September 2019

Flea Beetle Resistance Study

The odd behaviour to anyone unfamiliar with growing OSR made a return to Springfield Farm at the beginning of the month with me crawling around wheat stubbles looking for evidence of slugs and of course the dreaded flea beetle (CSFB). The dry conditions were ideal for CSFB, and sure enough they arrived at the crop after a week's reprieve post emergence.

With an eye to our 2020 OSR crop we took part in a research project undertaken by Rothamsted Research PhD student Caitlin Willis, looking at CSFB resistance to pyrethroids. This involved gathering 100 CSFB in our grain store during July to be sent off for testing. The Midlands region unsurprisingly, given the CSFB pressure seen last autumn and subsequently in the spring, provided a glut of samples and unfortunately ours didn't end up being tested. However, the results obtained made for stark reading, with resistance averaging 75% in the region. With this is mind anything more than a single spray is unlikely to prove effective and instead, our farm practice of focusing on excellent establishment and early vigour will be the mainstay in our fight against the CSFB.

Following a strong performance last season, DK Expedient is our main variety being grown at Springfield this year. The hybrid seed cost of £78/ha (50 seeds/m2), is approximately double that of KWS Campus (70 seeds/ m2) the conventional variety we have used on the farm for several years. The additional expense I feel is justified for the outstanding vigour it displays, even when compared to Campus, a variety known for its get up and go. As seen last year, the first true leaf of Expedient was emerging after only a week. With the diminishing effectiveness of pyrethroids and the detrimental impact on our beneficial insects from their use, swift establishment is the critical factor to survive CSFB damage.

Oilseed Rape Update

Conditions following sowing, as is frequently the case with WOSR, turned decidedly dry and windy. The moisture preserved at sowing thanks to the single pass establishment once again proved to be critical to aid strong, even establishment. Coupled with retaining soil structure this supported the young plants when the only relief from above was increasingly Autumnal dews. Shot holing soon became evident and an after dark check of the crop by torchlight illuminated at least one CSFB per plant meaning an insecticide was called for. The following evening the sprayer was fired up and set to work. I was quickly reminded of a job that was put on the to do list this time last year, which was to upgrade the tractor work lights to LED. Luckily though with no in field trees or telegraph poles in the OSR fields, I was reasonably unlikely to run into trouble!

We finally received 7mm of rain on the 10th Sept, which was as helpful to the crop as an insecticide. With the wind in a North and Easterly pattern, we did see a further migration of CSFB on the 13th, but by this point the crop had grown past the vulnerable stage.

With the dry conditions seen at the beginning of the month wheat volunteers were slow to germinate. This saw

Centurion Max not being applied until the 19th September at 1.0l/ha, in all but ideal conditions. But uptake of the graminicide was quick, as soils remained warm supporting active growth. The familiar yellowing of leaves of the volunteers was seen by the end of the month for a good result all round.



Inter row drilled Oilseed Rape

More mixed cover crops

Following the combine out of the Spring wheat, a quick turnaround was in order with the Mzuri Pro-Til being put to work sowing a cover crop comprising of oats, phacelia, vetch and sunflower. Maize was also added to the mix as a trial for an area, which although is rather a late sowing, with the ground being warm it will be interesting to see how much biomass above and below ground it delivers before winter sets in.

The cover crop was sown directly into chopped straw which still held a slight green tinge and as is our usual practice, we drilled at 30 degrees to the tramline/combine. The Pro-Til's staggered legs allowed crop residue to flow through with ease and the leading legs did a superb job of clearing a clean friable seedbed to drill into. Final reconsolidation came from the coulter press wheel, meaning no follow up roll was required, achieving a low cost and consistent establishment of a very important crop to our rotation.



The Pro-Til closely followed by the combine and drilled our cover crops at 30 degrees to the tramlines

October Crop Update

28th October 2019

October began as September finished, with almost daily rainfall. Whilst technology has many advantages, the weather apps for my phone with their frequent flood alerts became an unwelcome reminder of just how wet things were becoming.

Winter Wheat

Trying to find a silver lining to these clouds was the avoidance of temptation to get the main drilling done too early. Primarily as part of a blackgrass control strategy, but also this autumn with the loss of Deter seed dressing. Which following a summer where I had seen more insects than in a number of years, aphids and the impact of BYDV was also a consideration.

Although I will admit to suffering from farmers itchy feet which meant I did get two fields sown on the 10th October, during the slightest gap in the weather. Conditions were certainly more challenging than we had seen of late, with soil too damp to roll post drilling and with rain arriving in the evening. The Pro-Til's coulter wheels did a fine job of reconsolidation, with the pressure wound back as the going was soft. The harrow left a level finish giving good preparation for a pre emergence herbicide.

Maybe, it is the weathers way of saying enjoy uninterrupted rugby? To begin with, watching games in full on television was a treat, but as the month crept on, I would have much rather have been listening to games from the tractor cab.

Evidence of how far the health and condition of the soils at Springfield Farm have come, has been how well the large volumes of water have been infiltrating, when compared to similar soil types in the district where water pooled. So, albeit an increasingly damp profile, if or should I say when the dry weather does return, the structure and unworked topsoil will enable us to get back on to the field sooner, in what is looking to be a catchy season.



OSR

October saw continuing growth for the OSR, at least for the first half of the month with rainfall helping develop robust plants ready for winter. Although as damp conditions continued into the second half of the month growth noticeably slowed, as soil temperatures fell away. As is to be expected with the amount of rainfall and still mild weather, phoma lesions were becoming more readily



found by the middle of the month, especially on the variety Campus. An application of Rimtil (prothioconazole and tebuconazole mix) was made and keen to make the most of the pass I added a dose of micronutrients.

The graminicide applied during September did an excellent job on the wheat volunteers which had begun competing for moisture. Although effective on the initial flush of volunteers, the constant rain saw a second flush by the end of the month, which will now wait for propyzamide when conditions allow later in the year.

Cover crops

Our cover crops continued to put on growth during October, particularly the phacelia which had been quick out of the blocks post sowing and appeared to keep thriving in the damp weather. By the end of the month a run of frosts saw the sunflowers blacken off, although not the phacelia, we appear to have chosen a tough variety!



"With such heavy and sustained wet weather the value of having a green cover supporting soil biology, whilst stabilising the topsoil, ensures our most valued asset remains in the field."

Ready! Set! cover!

31st October 2019

After only five short weeks our cover crops have established evenly across the farm and thrived. With the benefit of straw and undisturbed soil between the crop rows this makes an ideal environment for grazing sheep later in the season.



Wet weather continues into November

30th November 2019

Oilseed Rape

Ten weeks of almost daily rainfall and oilseed rape make for unhappy bedfellows. With areas of our cropping looking a little worse for wear, plants are holding on but would certainly appreciate a dry spell.

Adding insult to injury, this autumn we've seen more pigeons around than we have ever seen in a number of years. And speaking of birds, the Early Bird Survey which reports on national cropping, suggests this year there is likely to be a reduction of 23% in oilseed rape area intended to have be sown and with many crops subsequently written off, the total area is likely to fall further.

With an overall 40% fall since 2011/12 at the end of the neonicotinoid era, this undoubtedly puts more pest pressure on those crops that have survived through to winter. Given the flea beetle pressure I am pleased we have been able to grow robust plants that can tolerate some grazing, however I am keen that the pigeons don't become too comfortable so time to dust off the bird scarers I think!

Winter Wheat

Our October sown wheat emerged well, and it has been enjoyable to be out doing some cereal crop walking. As to be expected with following OSR and the damp conditions, slugs have been active. We have used ferric phosphate pellets for a few years now and whilst more expensive initially, they come into their own in wet conditions where they prove to be far more durable than their conventional counterparts.

The value in having permanent tramlines in place has really shown its worth this Autumn, enabling us to travel shortly after rainfall ensuring products are applied in a timely fashion.

The bulk of our winter wheat drilling campaign was set to start in November with the anticipation of a rain free week on the forecast. Unfortunately, this never materialised with November proving to be the wettest month of the Autumn, with over 164mm falling. Surely, it can't keep raining?!



Birds scarers will be deployed to reduce the pigeon numbers to protect our OSR. In our Glyphosate free field, seen here we have been applying a fungicide to target Phoma, this is the third crop to be grown in this trial without the use of Glyphosate.



A frosty start in November for our Costello Wheat, drilled on 33cm row spacing with the double shoot coulter

Autumn Visitors

1st December 2019

Throughout the Autumn we welcomed several groups of visitors to the farm including agronomists, universities, and international guests.











The farm gets a tidy up with the Razorback

18th December 2019

As trial farm to Mzuri we also host the trials and testing for Mzuri's sister company, Razorback. Recognisable from its striking green livery, the Razorback Auto-Level is one such product that we have the pleasure of putting through its paces at Springfield Farm.

During December, the new flail head was put to the test on one of our more senior hedges and produced an impressive cut. Coupled with the quality controls of the Auto-Level unit, the end product is an easy to use, intuitive machine that makes even the most modest operator look good!



Closing the Decade with a legacy

27th December 2019

The year ended with planting, although not the planting I really hoped to do be doing. As part of an ongoing programme of restoring and creating new woodland and hedges around the farm, an acre of grassland was chosen to establish a woodland. In total we planted 500, UK sourced trees comprising of a mixture of deciduous species.

In time, this should provide a great wildlife habitat, helping to support biodiversity that borders both arable and grassland. Especially important as this year, we saw our first signs of Ash dieback over the summer which will have a great impact on our woodlands in this area as Ash makes up a significant portion of the populations. It was certainly a satisfying way to close a decade and should at least make it easy to remember in future years when it was planted!

With that in mind, from everyone at Springfield Farm we wish you a successful 2020 and a new decade, let's see what this one brings!



Hundreds of trees have been planted across the farm - a nice way to mark the end of the decade and the start of a new one $% \left({{{\rm{D}}_{\rm{T}}}} \right)$

Hooves return to graze the cover crops

2nd January 2020



The sheep made the most of a (short) dry spell over Christmas and grazed our inter row drilled cover crops

For a second winter running, sheep have returned to our arable acres to graze the cover crops. This follows encouraging results from last season, both in terms of residue and nutrient recycling, and the subsequent benefit to our spring cropping. Although, I will admit given the amount of rain seen during the Autumn and into December there was a degree of hesitancy. But with a clear spell of weather during the week of Christmas, and the option of a runback onto ridge and furrow grassland should heavy rain make a return, the sheep were set to work.

The cover crop mixture comprised of oats, phacelia, vetches and sunflowers, and as is our usual practice the crop was established inter-row of the previous wheat crop straight behind the combine with the Mzuri Pro-Til. The combination of stubbles on undisturbed soil and a strong stand of cover species, has ensured the ewes are carrying well. The grazier is also doing a great job of keeping the ewes moving, so that any one area does not become over trampled, safeguarding the condition of our topsoil.

Heavy soils cope well with the harsh rain given the circumstances

5th January 2020

Following an autumn that will live long in the memory it will remain ingrained not only for the volume of rain, but also for the total number of days it rained! The result has meant we remain significantly below our planned acreage of winter wheat as we move into the new year, but fields drilled early in preparation for Autumn visitors are looking well and are testament to the well structure soil we've built up over the years.

It's proven to be a real test of our heavy clay soils, but over the last 10 years having restructured, worm populations have rebuilt, soil organic matter has increased and with the soil now in overall good health I have to say it has taken the rain remarkably well. Resilience in our soils is something we can all aim for, particularly when the elements remain as unpredictable as ever.

With time still to plant our winter wheat if a weather window allows, our attention is beginning to turn to spring cropping and getting back on the ground. "Resilience in our soils is something we can all aim for, particularly when the elements remain as unpredictable as ever."



Early drilled Wheat looked well throughout December despite the mammoth amounts of rain we've received

Early drilled Wheat stays strong despite wet weather

20th January 2020

As the new year rolled round, I had hoped the weather would also make a turn for the better. And it did, for a short time, with the first couple of dry consecutive days on the farm since September landing between Christmas and the new year.

A welcome break from the relentless weather front that's made itself at home in recent months, I was optimistic that things may start improving. Since September, we have received a phenomenal amount of rain on a farm that is typically subject to the 'Peopleton Umbrella'. Wheat, drilled early in the season to establish in time for our annual German visitors, has done remarkably well despite almost a constant downpour since it was drilled.

Testament to the benefits of preserving soil structure, the combination of tilled and untilled strips allows the soil to restructure naturally whilst still providing a nursery seedbed for quick, even establishment. In wet weather the untilled, well-structured soil allowed water to freely drain away from the seed helping to keep the seedling healthy and in optimum condition.

This support system created by the Mzuri strip tillage technique has nurtured the young crop and gave it the best start despite the less than perfect conditions.

Unfortunately, not all of our Wheat got planted before Christmas with significant rainfall taking conditions beyond



Despite almost a constant downpour since it was drilled, our early drilled Wheat has put on a remarkable show – testament to the good soil structure built up over the last 10 years

a threshold, I was comfortable with. I am sure we could have mauled the crop in, but to what effect? We haven't spent the best part of the last decade establishing healthy soils to wreak havoc in a single season to save my pride!

My only wish is that I had put more Wheat in earlier in the season, but then, hindsight is a wonderful thing and I am confident that like previous years, we can achieve profitable, consistent spring crops with our Mzuri strip till system.

January sees a flurry of activity in our Oilseed Rape

31st January 2020



Inter row drilled OSR looks well between the rows of standing stubble as Bifenox is applied

As is typical with weed management in OSR, winter tends to be relatively busy. More so this year having opted to not apply a pre emergence herbicide on the crop in a bid to not slow growth during the vulnerable early stages.

Instead, Belkar was applied during December at a rate of 0.25l/ha, which did a swift and thorough job on a wide weed spectrum. Followed by a flurry of activity in January, we began on the 4th with Astrokerb at 1.7l/ha. Given the mild conditions, uptake was quick and the tell-tale swelling at the stem base followed by discolouration of the leaves soon appeared.

Two Saturdays later the sprayer was once again fired up, in ideal conditions to apply Bifenox at 11/ha plus oil. With bright blue skies and almost no wind, it suddenly felt like spring was just around the corner. Water rates of 2001/ha were used, to ensure good coverage over the odd areas of rogue charlock in the crop. And with three frosts in a row following, the application delivered an excellent kill.

Our permanent tramlines showed their worth once again and enabled us to travel when the weather allowed for spraying. This has been especially important following the appearance of a new spring at the highest point on the farm, underlining just how saturated the ground is!

Strip Till cover crops provide soil benefits over wet winter

10th February 2020



In the absence of frost, needed for frost rolling, two thirds of our cover crops have been grazed $% \left({\left[{{{\rm{T}}_{\rm{T}}} \right]_{\rm{T}}} \right)_{\rm{T}}} \right)$

Our cover crops which were sown straight behind the combine into chopped wheat residue, once again hit the ground running, with strong plants producing significant biomass and importantly ground cover. Cover crops are an important part of our cropping system, bringing a multitude of benefits both long term and short term. Particularly in a wet season such as the one we have had, the ability to maintain the superb condition of our topsoil is a priority. The growing cover acts as an umbrella, slowing the impact of rainfall, along with maintaining soil structure and stability through living roots – mitigating erosion and leaching.

One of the key elements of managing cover crops is their termination, so as not to be detrimental to the subsequent spring crop. With large biomass covers, they offer shading to target weeds, often requiring two passes of glyphosate to achieve the clean start required. Keen to maintain the efficacy of glyphosate, we have experimented with different methods of reducing this biomass.

Last year, hard frosts enabled us to cambridge roll a third of the covers, providing a shattering effect whilst laying the material back to the ground for our worms to take care of. Unfortunately, with no hard frosts this year, two thirds of cover crops have instead been grazed by sheep.

A third of our cover crops have been sprayed off in mid January to compare against their grazed counterparts come spring drilling

The mild and sunny Christmas through to the New Year period saw our cover crops make noticeable growth, not something we would normally expect to see at this stage of winter. But our winter woolly visitors certainly weren't complaining with a fresh bite to eat. The sheep have carried remarkably well given the rainfall seen during the previous four months which is testament to the excellent soil structure our heavy clays have developed after 10 years of Mzuri strip tillage. I am keen they don't graze any one area for too long so ensure that over half of the cover are naturally trampled with the remainder processed and returned to the soil, making the nutrients readily available to the following crop. With only a single pass of glyphosate required ahead of the drill.

As a farm centred around trialling different methods, it is important to be able draw comparisons between approaches, so the remaining third of our cover crops were sprayed off during the middle of the month. The mild winter has meant the sprayer has not required its normal winter break – tucked up, with a splash of antifreeze – Something I can honestly say, I can't remember the last time that this has been the case.

Winter crops move forward throughout February

28th February 2020



Our OSR is moving on nicely despite the relentless rain

February turned out to be an eventful month. Having been reminded at Lamma of the saying 'February fill dyke', surely, I thought this year will be an exception... But two named storms later and with significant areas of the county flooded, it turns out five consecutive months of above average rainfall was indeed perfectly possible.

Oilseed Rape got away well and continued to move

The beginning of the month saw our crop starting to move, in particular the variety DK Expedient which also proved its ability to get out of the blocks quickly and grow away during last year's Spring. A good starting pace has to be a key attribute I feel, because as we've seen this year, CSFB larvae can be found without too much effort, so it's important that the crop responds early so as to not risk being overwhelmed. We have always been quite lucky at Springfield Farm, in that the combination of a fast-moving variety, and a good nursery seedbed with accurate drilling depth and reconsolidation provided by the Mzuri Pro-Til allows our OSR to establish consistently year on year. This helps to mitigate a lot of the risks associated with growing rape which are causing the crop to lose favour across the country.

After such a wet winter resulting in low soil nitrogen levels, I applied 25kg/ha of nitrogen during the first week of February. This was just enough to give the crop a kickstart and an amount that is quickly washed in, rather than away!



Moody skies have been a permanent feature over our OSR this month



12 tonnes of beans have been farm saved for spring drilling

Last field of Winter Wheat drilled in early Feb

Among the relentless deluge, there was the slightest of weather windows which allowed me to roll out the Mzuri Pro-Til to drill a field of Gleam (450 seeds/ m2) on 5th February. This is the latest I have ever sown a winter variety, so I'm interested in monitoring its progress, with the last time being January 2013 on hard frosts.

The variety Gleam has the latest safe sowing date of mid-February; I just hope after what has been a mild winter that the crop has enough cool weather for its vernalisation. I was impressed with how the Pro-Til made a decent seedbed in what were marginal conditions, which was put to the test three days later with the arrival of Storm Ciara. The improvements to our soil structure over the years have certainly been proving their worth this year.

Preparations for Spring cropping underway

Preparations for spring cropping began in earnest in February, starting with the cover crops that did not see sheep which I sprayed off between showers. The covers were visually very sluggish to die off, symptomatic of the cold, wet soil conditions. Interestingly, large parts of one field turned red as opposed to the usual orange as did the field over the hedge containing the same mixture. This was suggested by our agronomist to be a sign of BYDV infection in the oat element of the mixture, a reminder of what may lie ahead with the loss of deter.

After last year's hefty cost for Lynx spring bean seed, this year's decision was decisively easier. We decided to farm save 12 tonnes and with a sample sent to PGRO for assessment coming back with a clean bill of health, we were good to go. The rain delayed our first attempt to have it cleaned, but when the sun finally did shine, Goldingham Contracts had processed the seed for us within a couple of hours – achieving a good sample ready for drilling.

Starting conversations at the Agrii Northern Farming Conference

13th February 2020

I had the pleasure of speaking at Agrii's Northern Farming Conference this year and was pleased to see a good turnout. My topic of choice, as you have probably guessed, was strip tillage and during the session I gave an overview of how the Mzuri strip tillage system was developed here at Springfield Farm.

With an emphasis on the soil benefits brought about by the conversion to minimum tillage, whilst keeping a keen eye on the cost savings along the way, the farm has gone from strength to strength ever since.



Over time we have shared and developed our five-step plan which focuses on:

1. Selective Tillage

We have found that by leaving long stubble and chopping our crop residue we can provide our soils with protection from heavy rain, retained moisture and increased worm activity. Growing crops benefit from the untilled soil strips which are rich in nutrients, oxygen and water which helps to promote quick healthy root growth.

2. Crop Rotation

After adjusting our own rotation over the years, I advise everyone to incorporate a minimum of four years into their rotation to promote better weed and disease control as well as making the most of sunlight over the summer months with cover crops. For us a typical rotation would look like OSR, Winter Wheat, Cover Crop & Spring Crop, followed by Winter Wheat but with the development of companion cropping we hope to push this further.

3. Surface Residue

Straw management is the key to strip tillage, and it all starts with the combine. We leave stubble long at around 150 – 250mm high and chop all our straw. We then follow this either directly with the Pro-Til or we may utilise a pass or two of the Rezult stubble rake dependent on the crop. By retaining our residue on the surface, we have reduced compaction, retained moisture and improved our organic matter levels and soil structure. Our earthworms thank us too!

4. Wide Row Spacing

Using the Mzuri Pro-Til we advocate wider spacings between crop rows as a means to promote healthier plants. The additional space created by our 33cm and 66cm rows optimises light interception and airflow for a healthier and stronger straw that is able to support higher yielding crops through to harvest.

5. Minimising Farm Business Risk

One of the biggest changes that we have seen since converting to single pass establishment is the significant reductions in costs and subsequent reduction in risk to the farm business. After quitting recreational cultivation, we have reduced our capital investment, as well as our labour, fuel and wearing parts cost. Reducing our cost of establishment has been one of the main ways we can better prepare the business for volatility in the marketplace.



For us wider row spacings have been a key component of healthier and higher yielding crops. Here we can see how the wider row spacing on the right promoted stronger straw which stood better during harvest, compared to the narrower spacing on the left.



During the presentation I demonstrated the history of some of the stark differences between the Mzuri strip tillage at Springfield Farm compared to conventional systems within the area.



Deer oh Deer

February 2020

More Springfield visitors caught on cameral

Fuel for thought: The Chancellor's Budget

20th March 2020

For the agricultural industry, March began with concerns over the Chancellors Budget on the 11th, with speculation surrounding the future of the lower fuel duty on red diesel. In the end, effective lobbying by our industry saw the idea binned, but it acted as a reminder of how exposed growers can be to yet another factor outside of our control.

But how exposed? The concerns around the Chancellor's budget has made me appreciate how the Mzuri single pass system has helped reduce our exposure to oil price volatility by significantly lowering our fuel consumption.

Prior to adopting the Mzuri system, the farm would undergo several passes to achieve a seedbed, even before a drill entered the field. Heavy cultivations including ploughing and power harrowing were not only time consuming but were burning significant amounts of diesel in addition to the associated wearing parts and tractor maintenance. Even on a relatively small farm like Springfield sitting at 450 acres, the diesel soon adds up. I stopped to pause about what effect still being on a draining system like that and having the risk of losing the lower fuel duty would have to us, and it would be simply unimaginable.

"The concerns around the Chancellor's budget has made me appreciate how the Mzuri single pass system has helped reduce our exposure to oil price volatility by significantly lowering our fuel consumption." As a ring-fenced farm, the majority of our fuel use is in the field working, but for growers who have to travel to get to pockets of land, the effects would be felt even further. The requirement to travel is not something that can be changed for these growers, but the number of trips to the field can be – with the help of a one pass system.

Now using the Mzuri Pro-Til, we consolidate seedbed cultivations, fertilising, seeding and reconsolidating into a single, targeted manner, awarding benefits to both soil health and establishment – and importantly, minimising fuel consumption. Of course, we have also achieved significant savings in labour, wearing metal and repairs, something that was so significant even in the first year, our farm accountant pointed out what he believed to be a mistake in the farm office bookkeeping. Fortunately, there was no mistake and in fact, it turned out to be the best change the farm has ever made.



Establishment has now been consolidated using the Mzuri system to significantly reduce our fuel usage, without compromising on crop health or yield.

Topping up nutrients in March

2nd April 2020

Oilseed Rape

In many ways this has been a month for wrapping up for the OSR. I applied the final dose of nitrogen at green bud stage at the beginning of month, bringing our total nitrogen to 200kg/ha for the crop. Being keen not to neglect the micronutrients, Brassitrel and straight Boron were added to the fungicide application during the first week. The fungicide, a generic containing prothioconazole and tebuconazole, gives us a good spectrum of disease control for spring, with only a potential mid-flowering spray left to apply to the crop.

Flowering began in mid-March with our crop of DK Expedient, living up to its major trait of being very quick out of the blocks. Other varieties in trial on the farm, were on average 5-10 days later to flower. Despite very few OSR crops in the area, pollen beetle levels remained below the threshold for a targeted spray and soon themselves turned into beneficial insects.

Flowering itself during March was a dry affair, hopefully lending itself to good pollination. Due to these conditions the decision was taken not to apply a mid-flowering spray to the DK Expedient for sclerotinia as the risk remained very low and with the variety making up 75% of our cropping, it will make a useful saving too.

Winter Wheat

Starting with what has been our latest seeding, the field of Gleam drilled on the 5th Feb had an atrocious first month to be emerging. With a robust seed rate, I have been pleased to see the crop emerged evenly through the ground. As I mentioned in the previous entry, I was concerned that vernalisation or the lack of it could be an issue, however after swatting up I have been given some reassurance that it can occur up to 15°c, albeit slowly. I need not have worried though as March gave us almost as many frosts (10 in total) as we have seen over the whole winter, that combined with a biting Easterly wind have kept temperatures down. have kept temperatures down.

The Easterly winds in the second half of the month did have a noticeable effect of steadying up growth, especially the newly emerged crop, but also in Autumn sown crops. Keen to bolster growth and to ensure tiller survival, I applied Sulfan to our wheats at 200kg/ha on 2nd March, followed on the 13th with 240kg/ha of 0-24-24. That along with 3I/ha of manganese. With excellent establishment, and a good network of roots anchored into well-structured soil, I am confident that all of our crops will be in good stead and will not hesitate to motor on when the weather picks up.



DK Expedient on the 26th March



The same field at the same angle 14 days earlier



Graham Winter Wheat drilled with the dual band coulter

In with the Beans

2nd April 2019

"I was keen to try something different this year and with the cover crop beginning to grow away thanks to the rising soil temperatures, I held back from spraying a field and went in with the Pro-Til on the green. With the living roots binding the soil, soil disturbance was further minimised, proving it to be an interesting experiment."

Beans going in with the Pro-Til as part of an experiment to compare against grazed and sprayed off covers

The weekend previous saw winds switch to the East which was ideal for drying the topsoil enabling great travelling conditions. Using the Mzuri Pro-Til's double shoot coulters at 33cm row spacings, we struck a good balance between good seed depth and the tilth necessary for excellent seed to soil contact. Bare a brief stint at the beginning of February, I have to say it felt good to back drilling with the sun shining!

The beans were sown in the last week of March at 310kg/ ha to give an established stand of 50 plants/m2. Whilst the seed rate is reasonably high, we definitely found this to be an advantage last season, both in achieving the target establishment, but also ensuring the stand created such a canopy that closes out any later flush of weeds that the herbicide was too late to catch. I also feel the higher end of this population has the effect of plants competing to a degree with each other for light, lending itself to improved podding from top to bottom of a taller plant.

Lending itself perfectly to seedbed placement fertiliser, O-24-24 was applied with the Pro-Til at 100kg/ha. A relatively small application but enough to meet the crops needs especially as it is band placed and made readily available. In reality, the beans bring many more benefits to the soil than they require nutritionally, altogether making them a satisfying break crop to have in the rotation.

The majority of our spring bean crop was sown into cover crops that had been grazed and then sprayed off ahead of sowing. I was keen to try something different this year and with the cover crop beginning to grow away thanks to the rising soil temperatures, I held back from spraying a field and went in with the Pro-Til on the green. With the living roots binding the soil, soil disturbance was further minimised, proving it to be an interesting experiment.

The limited amount of surface tilth was no issue for the bean seed which was placed consistently at two inches into moisture and then sealed in place, within tilth with the Mzuri's press wheel. The only hiccup to occur was my timing to go Cambridge rolling the field. As early evening turned to dusk my eyes strained to find my mark in the sea of green, and as much as I enjoy driving a simple tractor, GPS was sorely missed that evening.



Freshly drilled Beans into living cover

Spring Sown Cereals

29th April 2020

Starting with the Wheat

A crop that had already earnt a place in the rotation following last year's impressive performance, my attention turned to spring wheat on 27th March with 23ha to put in.

We have found there is two important elements to achieving good spring wheat performance:

Firstly, the varieties we now have at our disposal that can deliver on both yield and quality whilst doing so at a significantly lower input regime than its winter counterparts.

Secondly, and perhaps most importantly, establishment. The ability of our Pro-Til to create the perfect spring seedbed whilst placing a significant amount of the crops nutrition, targeted beneath the seed is crucial for a crop that has such a relatively short amount of time in the ground.

Bringing this perfect recipe of variety and establishment together, we opted again for Cochise, a variety with bread making potential. At a seed rate of 210kg/ha which gave 400 seeds/m2 we band placed 150kg/ha of DAP below the seed via the Mzuri's front leg for nutrition where it needs it.

What was striking as I knocked off the acres drilling this year's spring wheat was just how quickly the conditions were changing. With the wind still blowing strongly and the sun having noticeable strength, sowing conditions were all but ideal - a striking difference in the space of a fortnight. The crop was rolled the following morning, although had the forecast contained rain, we could have been back across the drilling a few hours later with how quickly the wind was hazing off the seedbed.

As we have trialled with encouraging results on winter wheat, we have sown a 4ha field of spring wheat on wide row spacing (66cm coulter centres). It will be interesting to see how a spring wheat responds, both agronomically and also in terms of yield. We will also be inter row sowing a portion of the field as a mixture of legumes as an understory at a later date.

Spring Barley

Like many growers across the country, barley is a crop that has not been seen on the farm in a number of years but is seeing a comeback this spring. To keep our rotation on track we have selected Planet as our variety of choice as an entry for oilseed rape. I have to say, from my positive experiences with the Mzuri system I am looking forward to adding another crop into our arsenal and watching the progress.



The in-cab entertainment for our Spring Barley sowing with the Mzuri Pro-Til!

Weather apps remained a staple throughout the spring barley drilling although unbelievably, the weather looked to remain dry and settled. With this in mind and the clay component of ours soils starting to show its character with the very sudden switch in conditions, emphasis was put on moisture preservation.

Thankfully, moisture preservation is an undoubted strength of the Pro -Til drill, which is especially emphasised in a spring situation where all too frequently, late rainfall is often a hit and miss affair.

Keen not to miss an opportunity to learn more about the agronomics and how we can push received wisdom on growing spring barley we have tried several different approaches:

Firstly, the trialling of different coulter widths, testing a standard 5-inch double shoot coulter and also Mzuri's new 3-inch coulter. Whilst the crop progresses, observations will be taken on straw strength, disease pressure, brackling and of course yield.

Secondly, we are trialling row spacing with both a more conventional crop drilled at 33cm centres and also at 66cm centres. Perhaps this will be too extreme, but I'm interested to see how the spring barley responds to the wider row spacings, given its yield is predominantly linked to the number of tillers produced and retained. It will be interesting to watch these trials develop and we will be updating you in due course.

A look at Winter Crops in April

30th April 2020



Graham Winter Wheat, Drilled in October soaking up the April sun

Winter Wheat

Ahead of the Easter weekend, as temperatures were building, I applied Nitram at 300kg/ha on 9th April. The winter wheat soaked up the sun and soil temperatures steadily rose as April looked set to be warm.

Coming into the month clean, the wheat really began to motor with the combination of longer days and plenty of moisture beneath their roots thanks to being drilled direct into stubbles and retaining structured soil between the rows. With such a dry month, disease pressure remained low and with good numbers of tillers, we were keen to keep them moving forward. Targeting leaf 3, the T1 fungicide was applied on the 16th April plus a 3C PGR and Manganese mix to deal with any latent pressure and to keep the key yield building green tissue clean.

Oilseed Rape

The beginning of the month saw 66kg/ha of Nitrogen applied to the oilseed rape, bringing the total to 200kg/ha.



From a distance, our oilseed rape crops had that familiar yellow tinge as they moved to the yellow bud stage in April. I stepped up the monitoring of pollen beetle and although present, they remained in low numbers. As a result, I took the decision not to spray the crop, especially as they were soon to become pollinators. April's warm and dry weather proved to be ideal for an excellent extended flowering period, achieving good pod set throughout the crop.

The biggest difference to the crop this year is crop height. The growing conditions of the previous six months of mild and of course, damp winter, appeared to manifest itself most obviously with crop height, being some 10-20% shorter than we would normally expect. With plenty of growing still left to do on the crop, it has branched well – promoted by excellent light penetration of the wider 66cm row centres created by the Mzuri Pro-Til.

The 'top ridge field' plots of OSR, with a combination of Campus and Expedient had a wider spread of flowering dates, with the Campus being approximately 7 days later than its hybrid counterpart. With this in mind and with the potential for some rain, Pictor was applied as a midflowering fungicide. The remainder of the OSR cropping around the farm comprises mainly of Expedient, so I took the view that the risk of infection would be low and avoided another pass and an additional cost. Whilst oilseed rape is seen as an increasingly trying crop to grow, once established it is surprising just how resilient it can be and certainly one that can be deceiving to the eye about its potential yield. By securing excellent establishment we have certainly not seen the back of it on this farm.



In with the Mid-flowering fungicide for the KWS Campus. Can you tell the difference between the two plots? Left is drilled on 66cm rows and right is at 33cm row spacing.



In the Press: Mzuri, Maize and Managing Soils

30th April 2020

DRILL MANUFACTURERS

MZURI, MAIZE AND MANAGING SOILS

Mzuri's trial farm manager and knowledge exchange officer, Ben Knight highlights the benefits of the Mzuri system for establishing profitable Maize crops this Spring.

Through regular contact with Mzuri users around the country and conducting our own trials, I have seen first-hand how the Mzuri system can reap benefits for Maize establishment.



Ben Knight

Under sowing and drilling into cover

By far the most relevant and up and coming aspect of successful Maize production that the Mzuri system is well placed to deliver surrounds under sowing or planting into cover.

Many of our growers are achieving excellent results either through seeding



Drilling Maize directly into a grass ley.

Maize and grass down alternating legs of the Pro-Til or by drilling directly into already established grass leys or stubbles.

I wholeheartedly believe that growing Maize with some sort of continuous groundcover will become a mandatory regulation in the near future in a bid to protect our soils from the huge amounts of run off and erosion we so commonly associate with Maize. Not only that but a growing crop underfoot can mean the difference between a harvested crop in the clamp or not being able to get in the field with the harvester in the first place (let alone getting it out again) – a sight



Simultaneously established Maize and Grass with the Pro-Til at Wappingthorn Farm. Photo kindly supplied by Frans de Boer.

that was all too common last year.

A grass based Maize system can provide businesses with additional grazing or another cut of silage from the grass crop, pre or post Maize. In a time where bottom lines are increasingly under pressure, this could provide a helpful alternative income for land that would previously be nothing more than a post-harvest mud bath, requiring extensive remedial action. The green cover will also mop up residual Nitrogen, making the most out of the applied products and returning it to the soil in a stable state.

I have no problem in advocating the use of dual cropping in a Maize situation and have seen first-hand how the network of roots stabilise the soil long after the Maize crop has senesced. When we're being faced with huge amounts of rainfall, a growing cover can give us the protection we need to keep our soils in the field where they belong.

Band placed fertiliser for better phosphate uptake

With the popular dual tank Pro-Til models, growers can apply DAP or another product of their choice below the seed via the front leg at the time

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of drilling. It's commonly known that Phosphate is very immobile in the soil, so by placing the fertiliser under the seed for the seminal root to access, the young crop benefits from guaranteed nutrient availability which is important for good plant development.

I have seen this replicated numerous times across trials where Maize has been established with and without band placed fertiliser. It was clear throughout the life of the crop what positive effects early nutrition (or the lack of) had on factors such as cob maturity.

By placing this fertiliser in a targeted band, it limits the availability of nutrients for weeds which helps to reduce competition and gives Maize the best possible start. It also has the added advantage of reducing the need for an additional pass which saves both time and money.

Accurate spacing, even around corners

There's no doubt I'm a

proponent for the Mzuri strip tillage system, but it's when planting Maize that the Pro-Til's independent pivoting coulters really come in to their own. By following the direction of travel of the drill, even around tight headland corners, seed is placed accurately into the centre of the tilled nursery zone. The level of uniformity across the field ensures row spacings and seed depth are consistent and coupled with the Xzact seed singulation units, plants are evenly spaced apart, maximising the light interception to be converted into yield.

As the founding fathers of strip tillage, North America have conducted many trials which highlighted the importance of seeding in the centre of the tilled zone. It's been well noted that seeds placed outside or on the peripherals of the tilled strip don't perform as well as those that are accurately drilled and go on to have a negative effect on the



Stubble underfoot protects the soils surface from heavy rainfall and aids harvester travel.

overall performance of the field. Pro-T

Lock up carbon and protect our soil structure

I'm delighted that soil health and carbon sequestration are finally getting the mainstream 'airtime' that they deserve. It's been long overdue but with discussion around the future of red diesel prices and the need for more sustainable farming there has never been a better time to look at the best way to utilise soil as our most precious asset.

The Mzuri system revolves around dense surface residue which I encourage Mzuri users to drill direct into, to preserve moisture, protect against wind and water erosion, and build organic matter supporting soil microbiology. Moving away from heavy cultivations, many direct drills simply can't cope with the levels of surface residue that we need to improve our soils and sequester sufficient carbon. In a Maize situation, arguably drilling direct into a grass ley provides little volume to drill into but as part of a wider rotation, the Mzuri



Evenly established Maize on the Mzuri trial farm in Worcestershire.

Pro-Til is equally at home drilling into standing cover crops and thick chopped straw. Good soil structure is certainly something you can't achieve overnight, but by fostering a long term, rotational view many users find that where they once sank to plough depth, their soils are better able to carry harvesting equipment and their ditches run clear.

Preserving moisture for quick establishment

Drilling direct into stubbles, grass leys or even organic fertilisers will preserve moisture at the time of drilling which promotes quick and even establishment. I've seen countless occasions where Mzuri strip till Maize suffered less bird damage than its conventional neighbours due to its timely and all together approach to emergence!

Preserving this moisture also has lifelong effects for the Maize crop, where it isn't uncommon to see drought reduce Maize yield by up to 22kg of dry matter per hectare for every 1mm of soil moisture deficit. This along with better presentation of fertiliser, quick even establishment and the potential to utilise a second under sown crop all makes Maize, which is naturally an expensive crop to grow, a more cost effective, and low risk option this spring.

If you have any questions on the Mzuri system, for Maize or any other crop, I would be delighted to discuss these with you. Get in touch with the office on 01905 841123 or benknight@ mzuri.eu

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Trying out the Razorback RT500

5th May 2020

In April I had the chance to try out the new Razorback RT500 rotary mower, which I used to top off the previous year's maize wildlife cover. The 3ha of maize that we drill with the Mzuri Pro-Til provides shelter and food for wildlife on the farm, positioned next to a young wood. It is a great space that we take pride in providing for our local wildlife and it is often a thriving hub of activity.

In preparation for this year's new crop, we used the Razorback RT500 to top and distribute the remaining maize, returning the crop residue to the surface for incorporation by the worms. This was then sprayed off and with a demonstration Mzuri Pro-Til Xzact in the yard, I took the opportunity to sow 1ha on 30th April with the seed singulation units. As a heavy clay field, that has certainly benefited from the return of crop residues, tilth was the best I have seen in this field. Coupled with good moisture it made for an exciting proposition. The remaining balance of the field will be sown using conventional metering at 33cm and 66cm row spacing.

Whilst we had the opportunity, I put the RT500 to good use on our field corners ready for sowing next month. We have taken to leaving several wildlife plots across the farm and awkward corners provide the perfect opportunity to make the most of the available space.

The new rotary mower ticked all the boxes in terms of ease of use and getting the job done. It was easy to adjust and manoeuvre in tight headland corners and gave a clean, level cut across both the maize and grass. Like its orange Mzuri sister, I found the RT500 to be a solid, well-built machine and made in the UK too!



With a Pro-Til Xzact Demonstration machine in the yard I took the opportunity to sow 1ha of Maize using the seed singulation units.



The Razorback RT500 made a tidy job of our expiring Maize wildlife cover

A Winter Crop May Update

1st June 2020

In what has been an extraordinary (although fast becoming our ordinary) month, records were broken for the sunniest month on record, as well as the sunniest Spring by some margin. This was coupled with continuing strong winds and only 1mm total rainfall for the farm in the month of May.

With many new eye-catching 'bio stimulants in a can' on the market, the bio stimulant that would make the biggest difference right now is rain, who thought that would be the case in March! As a result of the lack of rainfall, the biggest job of the month was keeping newly planted trees and hedges watered. All had been planted into permanent pastures and with the dry conditions, large cracks have been appearing in the fractures created at planting. This is not something I would expect to see in well-structured soils with good organic matter content, but it underlines the extremes we are experiencing. At planting, the saturation of the soil was at such a point that the holes dug to accommodate the new trees were quickly backfilling with water, a stark comparison as I make my way around with the water bowser!



Watering the newly planted trees has been one of the biggest jobs on the farm in May

Goodbye Chlorothalonil

The end of an era arrived 20th May as it marked the use up date for chlorothalonil. In use since 1964, chlorothalonil has remained the backbone of our fungicide programme here at Springfield Farm like it has been for so many arable enterprises in the UK.

Moving forward, an emphasis on agronomic traits and promoting healthier environments will become more important than ever as we move into an industry of fewer actives in our arsenal.

With the use up date in mind and with the flag leaf fully emerged, the T2 fungicide was applied on the 16th May and such has been the speed in development of crops this spring, ears emerged merely five days later.

Our February sown crop of Gleam has been progressing well, however in the short interval since the previous crop walk its name suddenly seemed fitting given the surprising amount of yellow rust gleaming back at me! I was aware when choosing the variety this was going to be its weakness, but I admit I was a little surprised at how quickly it had developed. One swift call to the agronomist and a couple of hours later, the sprayer was in the field treating the crop.

What was it we were saying about selecting for agronomic traits?



Graham Winter Wheat on 13th May 2020 looking consistent from headland to field centre

Winter OSR

With the next planned pass through the crop being the combine, May involved monitoring the OSR as the pods filled. On my inspections I had noticed a few isolated colonies of mealy cabbage aphid on the headlands but to my delight I did find a harlequin ladybird larvae feasting on the pest.

Somewhat clumsily, whilst trying to take a picture, I managed to knock him off his supper. Realising I was definitely more of a hinderance, I came to the quick realisation it would better to leave nature to it!

Maize

At the beginning of the month the remaining 2ha of our Maize wildlife field was sown using our Mzuri Pro-Til using conventional metering at wide 66cm and narrow 33cm row spacing. I was keen to preserve any moisture that may have found its way into the atmosphere, so I double rolled the crop, straight behind the drill. With plenty of residue from the last year's crop, paddles fitted to our rolls were kept out of work for this job. The result – a firm, fine seedbed, perfect for the pre emergence pendimethalin to do its job.



Our 'top ridge' field is long, open and well exposed but the OSR is standing strong

Drilling the inter-row companion trials

25th May 2020

Our long-term legume trial was sown to spring wheat on 7th April at 66cm centres, using a double shoot coulter. As intended, although a little later than planned having waited for rain, on 22nd May we went in with the Pro-Til 3T in Select mode (with alternate rows lifted out of work) minus a few wheels, to inter-row drill the companion crop.

Our species of choice are White Clover, Lucerne and Birdsfoot Trefoil, each sown in a separate plot. We're aiming to leave these companions in for a number of years/ as long as they remain productive 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. This will very much be a case of learning as we go along, and it will be exciting to document.





On 22nd May we drilled various legume species inter-row of the spring wheat to build the base for our long term trial

Spring Crops in May

29th May 2020

As spring progressed the strength of the Pro-Til in its ability to retain seedbed moisture has been critical with what has followed. This has been evident in the evenness of establishment and the crops ability to keep growing, supported by roots that are able to access moisture.

All of our spring cropping received a pre-emergence herbicide, spring beans with limited follow up chemistry was an easy decision but with the dry conditions seen as the spring sowing continued, led me to question whether it was the right option for the cereals. Fast forward to May and I feel the right call was made. With the pre em activated with the moisture that was present straight behind the rolls, our spring cropping was clean of weeds, despite the 10mm which fell in the last days of April - an amount that was hardly perceptible given how dry the topsoil had become but would have been enough to cause a flush of weeds.

Both spring cereals received their total nitrogen of 150kg/ ha within the first week of sowing. This came in the form of 150kg/ha seedbed DAP, followed by top dressed 150kg/ha Sulfan and 250kg/ha Extran. As we saw last year, this has paid dividends with unreliable rainfall so often seen during the spring, something we can ill afford to miss with crops that move through growth stages so quickly.

The spring cereals were tracking each other in terms of growth stages through to TI, but with a greater number of tillers seen on the spring barley. Chlorothalonil plus Jaunt for the spring barley/ Protefin for spring wheat.



Our Cochise Spring Wheat (Top) and our Planet Spring Barley (above) received their T1's in May and looked consistent across the farm.



On the 21st May our Spring Beans received their BLW spray ahead of the midday heat. I have been impressed with the excellent establishment even across the headlands.

Sterile strips for weed management

20th June 2020

Far from just appealing to the eye, our sterile strips play a vital part in our weed management programme. Used to avoid 'weed creep' from the headlands we maintain a 1 metre sterile width around our field which is particularly useful for keeping out grass weeds. It's a small thing but can have a big impact.



An example of our sterile strip around our Spring Barley crop this year.



In the Press: Dry Spring highlights clever drill design

15th July 2020

DRILL MANUFACTURERS DCUS...

DRY SPRING HIGHLIGHTS ZUC **CLEVER DRILL DESIGN**

The Mzuri system is widely recognised as Europe's principal one pass strip tillage system, unrivalled in cultivation, reconsolidation and seed placement accuracy. Ben Knight demonstrates why.



Ben Knight

As Mzuri's farm manager and knowledge exchange officer, I get to see a lot of Mzuri drilled crops around the country as well as those established by conventional and min-till methods. One thing that has struck me this Spring is how well Mzuri Pro-Til established crops have coped with the relentless dry weather.

On the Mzuri trial farm, the jovially named 'Peopleton Umbrella' struck again and saw us with no measurable rain since the Cheltenham festival. Thankfully, the Pro-Til's ability to cultivate, reconsolidate and seed into the perfect nursery seedbed, surrounded by structured soil, gave us the edge when it came to preserving moisture and supporting crop growth sans rainfall. Despite this, both our Winter and Spring crops look well and benefited from rooting into moisture, preserved by previous crop residue and have gone on to produce, healthy viable crops. However, you don't



At the time of writing during the second week of June, our Spring Barley had received no rainfall since it was drilled on 2nd April but established evenly and went on to grow into a healthy crop from headland to headland.

have to go far to find crops that weren't so lucky. I've seen both conventional and min-till crops in surrounding areas struggle with the drought from a combination of either moisture loss at drilling, or a lack of sufficient seed to soil contact and poor reconsolidation.

This is why I can see the value in the Pro-Til's cleverly designed features that allow us to prepare and seed into the perfect nursery seedbed, without compromising

establishment or soil health. It is the collection of unique features that are laid out below and overleaf that makes the Mzuri Pro-Til an incredible tool for consistent crop establishment across a range of seasons.

I'm pleased to see so many Mzuri users reaping the rewards of the Pro-Til's clever design and what is proving to be a reliable crop establishment system time and time again.



Benefits of the Mzuri Pro-Til

- Targeted tilth promotes even germination across the whole field, particularly noticeable on the headlands.
- Excellent seed to soil contact and dual reconsolidation removes air pockets and ensures quick, healthy root development - eliminating hairpinning and other common direct establishment problems.
- The uniform growth of the crop makes timely herbicide application easily achievable.

It's all in the design Zone A - Cultivation

The serrated disc cuts through the surface straw allowing the residue to flow freely to either side of the tilled strip. The auto-reset tine, coupled with replacement point and wing, cultivate the seeding zone to ensure a clean strip of moist, friable soil, free from surface residue. Band placement of fertiliser below the seed reduces the fertiliser requirement and ensures early

- Soil compaction and erosion is reduced by eliminating conventional cultivations – the same tramlines can be used year after year.
- Staggered tines and high trash clearance allow for drilling into high biomass cover crops, meaning crop residue can be left in the field, on the surface, providing organic matter and resources for micro-organism activity.
- Tillaging only a targeted area will make dramatic savings in

nutrient accessibility, providing essential support for quick, strong and healthy establishment.

Zone B - Reconsolidation

A key feature with the Mzuri's unique design is the fact that all of the machine's weight is evenly spread across all of the cultivated strips, fundamental in reconsolidating the tilled strip to remove air pockets, widely recognised as very necessary to ensure quick, healthy root development. cultivation costs with huge reduction in fuel and labour costs.

- The Mzuri non-inversion tillage system will increase the soil's organic matter and worm population; this will in turn further improve the soil structure and fertility.
- The physical condition of the soil will quickly improve to a more friable structure with a better balance of air, minerals, humus and water.

Zone C - Seeding

The coulter tool bar works totally independently to the cultivation zone, ensuring easy adjustment and constant seed depth control. Each coulter hydraulically exerts pressure to each of the seed depth wheels to ensure accurate seed placement and excellent seed to soil contact for quick and even germination. Each coulter arm features a patented pivot to provide optimum seed placement within the tilled zone.



The sun shines on our wildlife corners

1st September 2020

The Summer sun made for a bright photo opportunity of our wildlife corners, with Sunflowers being a firm favourite at Springfield Farm. They thrive with our strip tillage system and are low maintenance whilst providing a rich and valuable food source for birds and other creatures. With a bordering strip of Maize, these corners have been a great way to utilise awkward angles and put them to better use. They have been quite literally a 'hive' of activity!





Our Sunflower & Maize corners established well with the Pro-Til



Cheery blooms prove popular with bees and their nutrient rich heads go on to provide ready made bird feeders as they begin to dry out.

Winter OSR Harvest



Harvest began on 17th July for our OSR crop

At a time when many are turning to conventional varieties to reduce costs as risk mounts, we persisted with hybrids, chiefly for their vigour in Autumn and in Spring. However, it was another trait that came to fore ahead of harvest, following high winds at the beginning of the month.

Typically, our oilseed rape ripens fairly evenly thanks to even germination and stable soil health, and as a general rule we don't desiccate or apply pod stick ahead of harvest. However, with the exceptionally high winds I admit to being concerned.

As our sprayer is tractor mounted, and with more damage likely to be caused than avoided by applying a pod stick, the pod shatter resistance gene has been more important than ever.

This was highlighted in our side by side plots containing varieties with and without the gene. A week following the wind emerged a green scattering beneath the canopy where there was no genetic resistance, whilst it remained free of volunteers beneath our main farm variety that contains resistance. Far from a precise science, but I would estimate losses at 2-3%. Whilst not a huge loss on this occasion, it comes at a cost and is frustrating so close to harvest.

Harvest itself began on 17th July, after having initially seemed as though it would be much sooner. Our crop, as reported for many across the UK, was around 20% shorter than we are used to. Nonetheless, it was well branched and podded, with stubbles left a fraction shorter than normal to ensure the header captured everything.

Overall, the crop this year averaged 3.46t/ha, a little disappointing given our long-term average is near a tonne a hectare more. Although, when reflecting on its 11 months in the ground, particularly the extremely wet and mild winter, its testament to the establishment that it was able to tolerate this, along with flea beetle pressure to still deliver a profitable margin.

Interestingly, after last year's harvest where the heap seemed almost alive, along with the procession leading out of the grain store, flea beetle were conspicuous by their absence. Can we see that as good sign for sowing in a months' time? I shan't be holding my breath!



Although around 20% shorter, the crop was consistent from corner to corner and branched well



A shot during harvest from our Glyphosate free field, now in its third year without the popular (or unpopular) active!

Winter Wheat Harvest

The last week in July saw our winter wheat harvested. Beginning with our late September sown Costello seed rate trials, three different seed rates were applied from the farm standard rate of 320 seeds/m2, to as low as 160 seeds/m2. Each one-hectare plot was taken off individually and weighed. Running the trailer back to the weighbridge it is great to be able to put an accurate figure on output for our trial plots, as often margins can be fine.

With the plots safely off, it was into our main crop of October sown Graham. A solid performer on this farm both agronomically and in yield. With the weather changing dramatically and thus soil conditions between our September and October sown crop, Graham once again delivered a solid performance, averaging 9.2t/ha, with good bushel weights. A few days of combing later with fields cleared, the early winter wheat harvest left the perfect clean slate for early entry of our cover crops, providing them with the whole of August to get to work and build biomass.

Sown in somewhat of a no man's land, with a drill date of early February. Our field of Gleam, although a winter variety, it was treated like a spring crop from the beginning with inputs tailored accordingly. Combined on 10th August, the crop went on to yield 6.8t/ha, which given the spend was far from disappointing. Not a record breaking yield by all accounts but i have been pleased with how well the crop has coped with the relentless wet and then dry weather. Had we have still been farming conventionally, I fear our margins would have taken a more significant hit.



Costello ahead of harvest

Spring Barley Harvest

With memories of the 'barley itch', I wasn't entirely relishing harvest. The crop however, looked a picture with corner to corner establishment and no lodging, despite no PGR having been applied. This a characteristic of the Mzuri system, with the row spacing enabling excellent light interception, which in turn supports a healthy plant with strong straw. Easing the life of the combine driver, but also grains that are an even moisture across the field which dry down much guicker.

Combining commenced on 7th August in 30c heat - thank goodness for cabs and air conditioning! As you would expect no drying was required, just cooling beginning from its first evening in store. The crop threshed very well, allowing good progress to be made. That was until the wobble box decided to throw a wobbly and give up the ghost. Luckily, I was able to source one in Warwickshire, so a quick a dash to collect and then fit, 4 hours later we were back up and running. Not bad considering, although it is frustrating to lose any time when the weather is with you.

Half of our spring barley was in the barn before the rain arrived, keeping us out the fields for 10 days as 50mm of rain fell sporadically. I was pleased to get a good portion of the OSR ground cleared early, allowing drilling to commence, which was our target in growing barley to keep our rotation on track.

As a new grower of spring barley we felt it was the ideal opportunity to try different combinations of coulter spacing and type. Using both 33cm and 66cm coulter centres, as well as our two types of double shoot coulters, at 3inch and 5inch widths. Spring barley was the ideal candidate for its willingness to tiller, making best use of the extra space afforded in the various settings. There was little to choose between coulter types in term of yield, with the standard 5inch coulter delivering 0.15t/ha additional yield. This small yield penalty may be offset when deployed for lower disturbance or an under sowing situation. The wide row spacing delivered a pleasing result, despite its unusual appearance, strong tillering enabled it to achieve 64% of the yield of the standard row spacing, despite less than half the ground sown. With all of our spring barley in the barn the crop averaged 6.7t/ha, an excellent result, especially when viewed against the low cost of growing the crop. Additionally, it has been an excellent entry for OSR, whilst also remaining immaculately clean from grass weeds, a winner all round.



Spring Barley row spacing trial, left 33cm and right 66cm shortly ahead of harvest



Looking consistent across the field as the Spring Barley goes under the knife



Spring Wheat Harvest



Spring wheat has to be my favourite crop to grow. From excellent establishment, to a simple spray programme, with strong standing without PGR and ease of combining.

Combining began on 8th September, which despite perfect weather with temperatures nudging 22c, moisture refused to drop below 18%. However, with otherwise perfect going, the first 2 fields were cut and in the barn. The next morning brought the second heavy dew of the autumn, so with the combine serviced, a sample was taken for testing at our local grain merchant. With milling quality in its genetics, although not pushed with a late protein spray and suchlike to hit spec, I half hoped it might sneak over the line. I was pleasantly surprised when the results returned protein of 14% and Hagberg of 326. The protein was beyond what I had anticipated, but more pleasing was the Hagberg holding up despite having 2 inches of rainfall during its last fortnight in the field.

The reliable September wind finally picked up in the late morning and we were going again after lunch. The wind made all the difference drying the crop down, with the remainder harvested at 14.5% moisture. Yields over the weighbridge recorded an average of 7.62t/ha, which whilst slightly down on last year still delivers a good margin.

Cochise Spring Wheat matured evenly corner to corner

Combining the inter-row spring wheat

The final wheat of the year to harvest was our wide row crop with an inter-row legume mulch. It was equal measures of trepidation and anticipation putting the combine into field. With a strong stand of legumes and the Roman's to blame for a handful of fat hen plants, green matter in the sample was a slight concern. Cutting the crop as low as I dared go whilst not missing any ears, I soon had a visual in the tank of largely clean sample. With grain moisture at 16%, requiring a pass through our batch drier anyway, I need not have worried. The small amount was soon ejected out of the top, leaving a behind a perfect sample.

Once the combine was correctly set up it was an enjoyable job, our combine header matching up perfectly with 10 wide rows of wheat, revealing beneath, vibrant green strips. Yield matched almost precisely half that of the farm average. In truth spring wheat was always the wrong crop for the situation given its lack of propensity to tiller and therefore not commercially viable, but it is useful to capture the information to inform future practice. Whereas winter wheat at the same spacing yielded 9.56t/ha last harvest, equating to 80% of the farm average that year.



Pre-harvest in our inter-row companion field



Clean lines of the Clover beneath the header



Clover Close Up!



Lucerne has been another legume we have trialled

Spring Beans Harvest

20th September 2020

To round off harvest in mid-September, 60 days after it first began, it was the turn of the spring beans. As we had seen with the oilseed rape, it was a much shorter crop this year, as much of its key early development occurred during the extraordinary hot and dry spell of April and May. Despite this the plant population remained good at about 45 plants/m2, compensating to an extent for reduced stem heigh and thus pod numbers.

Black dust was soon flying, although extra concentration was required as the header was kept as low to the ground to make sure pods were not being missed. Overall yield was down on last year's bumper crop but seen in the context of our rotation it provides a fantastic break and the ideal soil conditions for sowing wheat next month.

Reflecting on 2019/2020

Looking back on this farming year, our soils have been tested in all manner of ways and I am pleased with just how well they have fared. The importance of our chopped straw residues, stubble management which keep the soil structure intact and cover crops have all benefited both our soils and system - allowing us the flexibility to grow profitable spring crops, rather than compromised winter crops or summer fallows.

Another element of flexibility derived from Pro-Til system, is where over half of the field remaining untouched at sowing, enables the carrying of livestock during the winter without detriment to our topsoil. Sheep have been a fantastic addition to our approach to cover crop residues, which typically require one less application of glyphosate. Importantly, as the aim of our cover crops is to benefit plant and soil health, deploying above ground livestock supports our below ground livestock. By beginning the processing of residues for the bacteria, fungi and worms to continue, they provide readily available nutrients to support new crop, ensuring the link between plant and soil remain strong.

Our long-term trials of winter oilseed rape and wheat produced some good results. And whilst overall yields were down, the information gathered is undoubtably useful to paint a true average of performance for seed rates, row spacing and genetics. The opportunity to do similar trials with our spring cereals was too good to miss. With spring barleys propensity to tiller, the 3 row spacings, each delivered strong results, ideal to be deployed in different scenarios in a commercial setting. The spring wheat inter row legumes offers exciting opportunities for the future and is something I am very much looking forward to building upon.

Looking to the year ahead

Like many farmers around the UK, a blank canvas and the potential a new cropping year brings, is anticipated more than usual. Our plans for the new season include the expansion of field trials with a view to future cropping, whilst building on long term trials. Such as those looking at seed rates and row spacing, for both winter wheat and oilseed rape. Capturing the effect of each variable, across differing growing seasons.

The addition of barley to our rotation was not something I had planned in the autumn of 2019. However, following positive results with this year's spring crop, we are sowing two fields to winter barley. The plan in the coming spring is to drill into the standing crop of barley, ahead of it being combined in July. This is a method well established in other areas of the globe but has yet to be implemented commercially in the UK. The opportunity to double crop our arable fields has many potential benefits such as reduce pesticide use, protection from predators in the more vulnerable early growth stages, as well as two cash crops to market.

The mixture of perennial and annual crops in our legume inter-row mulches has delivered some excellent results so far. Although not without challenges, the legumes offer many potential benefits to our annual cash crops such as the obvious nitrogen fixation, along with weed suppression and habitat for beneficials. All of which are critical aspects of arable farming that are under pressure on many fronts. It is an approach that the Pro-Til adapts to perfectly to and I look forward to sharing our experiences as the trial enters its second season. Planting in another form is also set to continue at Springfield Farm, with pockets of woodland and hedge replanting earmarked for the winter of 2020. These are without doubt important components of our farm environment, contributing to its diversity and productivity over the long term.

As an industry we have many changes on the horizon, in terms of both trade and the support system, combined with scrutiny of emissions and pollution. This I am sure will offer many opportunities, the biggest of which is effecting change at a farm level. As we have experienced at Springfield Farm with the application of the Mzuri strip-tillage system, a system that has enabled our diesel use to plummet whilst sequestering carbon through crop residues, as well as cover and catch crops all being returned to the soil which are able to be sown directly into. This approach has seen our heavy clays restructure and repair as soil biology has increased, along with overall resilience as the soils can better cope with extremes in seasons as well as supporting healthier plants. This has helped future proof our arable system as well ensuring a profitable business today.

Wishing you all a safe and successful season.

Ben Knight

Farm Manager

About Springfield Farm

After uninspiring yields, and rising input costs, Martin Lole developed the Mzuri one pass system and converted the plough and press based Springfield 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.

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.



Martin Lole developed the Mzuri Strip Tillage system on Springfield Farm.





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