

Soil Farmer of the Year 2023 – Farm Walk with Richard Anthony

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Richard Anthony, of R & L Anthony near Bridgend, was awarded Second Place in the 2023 Soil Farmer of the Year competition. He was commended on how he responded to and managed challenges, never veering from thinking holistically, always upholding soil health as a priority, and treating each challenge as something from which to learn.

A majority arable business, Richard farms a 6-year rotation of wheat, maize, oilseed rape and westerwolds intermixed with a diverse array of cover and companion crops which he is passionate about. Assessing the soil throughout the year has become second nature, looking at soil structure, cultivation implications and rooting depths, all to confirm choices made or to inform of any alterations needed in the future. A big emphasis on farm is building resilience into the system, but to achieve this, it is crucial to scrutinise and adapt. Richard, ever the optimist, always sees setbacks as opportunities to improve, and that mindset has contributed greatly to a highly functioning and productive farm.

Whilst aiming to achieve optimal production value across the farm, Richard has also strived to create a haven for wildlife. For example, canary grass and miscanthus have been planted to link the wood in the valley on either side of the farm to form a wildlife corridor. Alongside this, there is an area planted in wild bird cover which is allowed to grow taller and wider each year. Likewise, hedgerows, bordered by a 3-metre margin, are encouraged to grow 4-6 inches annually, becoming bigger and bushier; providing habitats, shelter, and an abundance of berries to support birds, pollinators, and beneficial predators. Richard has also implemented a 2m flower margin around all fields of oilseed rape which has been, to quote,

“absolutely fantastic.” Encouraging insects and bees and getting the public on side too.

The farm walk itself took place on 23rd November 2023, by sheer luck, one of the very rare days with no rain. It all kicked off in Richard’s converted barn, equipped with a wood burning fire and plenty of delicious cake and biscuits to fortify us for the day. Richard opened with a presentation taking us through the past year, outlining the various activities and obstacles the farm faced; what the team learned and how they responded, or how they planned to respond. We were then treated to a fantastic farm walk whereby Richard gave our group of visiting farmers, agronomists, and advisors a tour of some of what they get up to across their extensive arable and forage business.

A big part of what Richard and his team are trying to achieve across the farming business is to use very little bagged fertiliser – most of the nutrients applied to the soil come from the digestate, conveniently stored in the farm’s digestate lagoon. Tankers come in and fill alligator bags for easy transport and the digestate is spread on wheat, oilseed rape and maize. As Richard explains:

“All wheat receives two applications of 20m³, oilseed rape gets one application of 25m³, and maize receives one application with a dribble bar after the first pass with discs, and a second application down the tramlines. Maize and OSR won’t then receive any fertiliser; however, wheat does get a small amount of early application.”

This would be difficult to achieve without the construction and set up of the farm’s own digestate lagoon, one of the biggest projects undertaken in the last 12 months. Richard describes:

“It is essentially a giant bag weighing 5 tonnes which stores 4500m³ of digestate. A big challenge through the winter but it kept everyone busy.” Including Richard, who at the last minute became “chief engineer” after the real one didn’t turn up, “I learned a lot about levelling” – not something he expected to come out of 2023.

“Rolling the bag out was easy. Six men put the lining down in the bottom on the first day; then fourteen men rolled the bag out on the second. Where it became tricky was when we needed to manoeuvre the bag so that the two outlets (the sock that fits around the outlet) fit correctly.” Luckily, Richard’s measurements were correct.

“A few days later a tanker arrived with the first load of digestate. Once unloaded, two electric stirrers (run on a generator) started to agitate the digestate, preparing it to be spread.”

Within 4 days, Richard had installed and set up a functioning digestate lagoon.

Richard is always trying to reduce fertiliser application, as he explains, “We are hoping to change next year, we’re learning all the time. In the future, we plan to use a small amount of liquid N with an inhibitor to try and make the system more resilient and efficient.” We look forward to the results.

Another aim of the farm is to use less fungicides and to help achieve this, Richard has changed the sprayer. “To use less fungicides, you’ve got to get the timings right. The challenge here is our proximity to the coast and the short window that we’re able to spray. It’s either wet or windy. When there is a dry spell, we get the thermals and it’s a job to get the spray days.”

To adapt to this, Richard explains “I’ve gone to 250 cm spacing. This means I can run booms very very low. In the wind, there is no drift. It’s going

perfectly really - I have more spray days to get the timeliness right.”

Richard farms a 6-year rotation with 9 crops. “The emphasis on farm is the soil, improving the soil and organic matter, and keeping a crop in the ground; keeping the soil biology alive.”

The rotation is: wheat (usually direct drilled straight into a cover crop of phacelia), westerwolds with vetch - this is cut by the middle to the end of April. Once taken off, the ground is turned back around and maize is planted. After maize, it is then back into wheat, followed by OSR with companions and finally a cover crop before returning to wheat.

The farm cultivated and drilled maize in 14 days. “The first week was perfect, however, the second week we had dry easterly winds; it was drying out so quickly in between every pass we were having to run a roller, it was quite a challenge to keep any moisture in the ground.”

To try and adapt to these conditions Richard recounted “We ran over the first time with a joker set of discs and a cross cutter to cut and chop up the stubble. As we only have about 6 inches of soil depth, sometimes 7-8 inches, we used a top down with a narrow point, moving less soil and getting the crack between those tines. Following straight behind we ran through with a top down and joker discs, then a roller, then a drill.”

Richard works with a strip-till drill, only moving the soil where he is planting the maize. In theory, all works well, however, when applying digestate Richard finds “there is a problem trying to get the nutrients into the plant. Last year was quite disappointing. It was so dry after planting that I think we lost a lot of nutrients. We still have lots to do, we’ve just got to keep on trying for next year.”

As with most farmers across the country, the weather was the biggest

challenge in the previous 12 months. “We had dry weather with little rain in May and June, and then as soon as the combine was out, it started to rain. There was a lot of moisture there, some crops were cut up to 31% moisture – a lot of farms wouldn’t believe the moisture we had when we cut the crop.”

Luckily, Richard had installed a biomass boiler 6-7 years ago for grain drying after a very wet harvest. “We heard about them up in Scotland where farmers were cutting wheat over 30% moisture – best advice? Go up and have a look, every farm has a biomass boiler.”

For Richard, it has been a game changer. Their 1-megawatt biomass boiler provides a lot more spare heat than previous methods of grain drying where they used up to 1.2 megawatts of gas on one drying floor. In the old system, if they were on 25% moisture, it took 10 days to dry one side. With the biomass boiler on woodchip, they can dry 2 drying bays, double the output, and never have to run the boiler flat out, hence lots of spare heat.

To capitalise on the spare heat, Richard has installed an ORC heat recovery “basically, it takes the heat, puts it through a heat exchanger, this heats a liquid refrigerant which expands, turns liquid to gas, the gas then turns a turbine which generates electricity on site.” The gas is also used to heat a tank of water which then runs the drying floor. Since installation, Richard has put in two more drying floors so he can now dry his own grain and his neighbours.

The biggest learning outcome for Richard from all of this was “once the corn gets to 25% moisture, start cutting – do not wait. You get good output from the combine that way.”

“You do, however, need to have the right type of combine. We use a MacDon belt header, which will feed even through high moisture, and you

can cut wheat that's flat and it doesn't slow you down – takes a bit of believing, but it does the job."

The farm also spends a lot of time on drainage: "I've got a chap, 5 days a week who spends 90% of his time on drainage." Ditches are cleaned, dug out, drains put in; all with the aim of evening out patches in fields and making the farm more resilient. "It's great getting 16t/ha on wheat in a bit of field but if you're only getting 3t/ha in another part because it's too wet there is space to do better – work on pieces that are poorly drained. There is a big emphasis on drainage on farm."

For 4 years, Richard has been working on establishing home-grown proteins. The first trial started small, working with Steve Corbett from Agrii and a little push drill. Initially, they planted lupins field scale but then moved onto branching lupins which were planted at the end of April last year.

Richard explains, "we harvested rye westerwolds in the morning and then drilled the same field in the afternoon". What they found was that the lupins grew and filled out well, but during the very dry spell, they stopped flowering. When it rained, they flowered again and kept putting pods on. Richard admits "We got too greedy this year. What we should have done was spray off the third week of August. Instead, we waited until well into September and lost about 50% to the floor." However, all was not lost "the yield was still amazing – 21t off a 27-acre field, a lot more than what we were getting with the non-branching type before." Main learning outcome from this: "have the lupins ready to combine straight after wheat harvest."

As with most farms, rainfall is the limiting factor. Too much rain, however, is a problem. Planting OSR in August was a struggle. "It was so wet, the

bottom third of the field was too wet to put a tine into and cultivation turned the ground horrible. We ended up planting the wet parts of the field by snipping the OSR with a sprinter drill. The dry parts we then planted with a farm standard drill and a top down putting the tine in at 4-5 inches." As Richard remarks, "so far so good."

To get through the awful weather, Richard has a selection of drills "rather than sell them second hand where they're not worth a lot, I've kept them and run 2, sometimes 3 drills if we can. It's all about drilling as soon as possible when we have the right weather." This was especially helpful during autumn when the farm received 295mm of rain in October with only 7 days out of 36 without any rain.

Still, the most used bit of kit on the farm is a spade. By continually monitoring and assessing soil structure, Richard can make a well-informed decision when determining how to establish the next crop. Through adopting this method, Richard felt confident enough to direct drill the wheat straight into Italian ryegrass stubble, maintaining an environment for biology to thrive. This was perfectly encapsulated in a photo of his dog with a nose covered in spiders' webs. Needless to say, Richard is very happy with the results.

Farm walk

During the farm walk, we were shown multiple cover crop and companion crop trials that were taking place on the farm. Steve Corbett from Agrii has worked with Richard for many years, trialling different varieties and combinations, he explained, "it is important not to throw in any old companion or cover crop, 60% are a complete waste of time. This is either

because they have not been established well or they are not the right species in the right place.” Steve and Richard have found that OSR completely lends itself to companion cropping. Standing in a field of OSR, beans, vetch and phacelia Steve talked us through his thoughts and findings:

“OSR is a lazy rooting brassica, it needs help to get its roots down. Here with shallow soil, we need to make enough of what we have. We want something to compete to grow with the OSR, and help get the roots down. Beans are wonderful at rooting and nodulation. I want roots dripping with nodules and essentially that’s what we’ve got. We’ve also got vetch, which often looks a bit weak. This particular one is a spring vetch: why spring vetch in the autumn? We want rapid growth. Winter vetch is slow to get going; spring vetch will crack away in spring and really fire up. So we have nitrogen fixation and good rooting. In addition to beans and vetch, we have buckwheat. This won’t grow as quickly as OSR and doesn’t provide a very deep root, but it is great for scavenging phosphate. It also helpfully disappears in frost and in terms of flea beetle, it provides a little bit of canopy alongside OSR to slow the flea beetle down. Overall, companion cropping with OSR is working well.”



Richard follows on:

“In a typical farmer fashion, we’re trying to do more than one thing at the same time. First and foremost, try to establish your crop of OSR and get it through to harvest. Currently, we’re going at 30–35 seeds per square metre. By going low seed rates, we get big branchy plants in spring which grow away, allowing light through the canopy. As a Yorkshire farmer once told me, you’ve got to be able to lie in your OSR on the floor, look up and see a bit of sunlight.”

“We allow the canopy to keep growing. Once it flowers, it will keep growing as it continues receiving sunlight. Now we have a deep canopy of pods. This does create a number of problems, the biggest being flea beetle.

Companion cropping helps with this as well as digestate and OSR type.”

For example, the beginning of September brought some of the highest temperatures of the year which caused the flea beetle to “go nuts”. Instead of turning to insecticide, Richard spread 8m³ digestate, and much to his luck, the flea beetle hated it and disappeared. Also, by choosing thicker and well-branched OSR types, Richard explains, “If flea beetle larvae are in the plant, only one thin branch of the plant will die and often in the outer leaves, so we still have the middle to branch out. It provides a plant that will survive despite a pest living within it.”

In addition, we are reminded that companions are carrying out other jobs as well. “Here we have two fixing nitrogen and buckwheat mining phosphates, when they die off, all of it will be released back into the soil. Lastly, because low seed rates are prone to pigeon problems, having buckwheat and beans in there creates a canopy that pigeons don’t like to land on. That’s why we have ended up on the three-companion crops that we have.”

Steve follows:

“As Richard says, it’s a balance of materials. Companions all growing together helping roots to get down, maintaining that density of biomass, outcompeting pigeons and grass weeds allowing OSR to perform. Another important thing to ask yourself is: How much does it cost us? What is the yield? You must monitor this, it is critical. Don’t just bring it in and pay £40 a hectare on seed, it must earn its keep. In this instance, yield is not affected.”

When choosing OSR varieties Steve explains that he isn’t looking for the best yielding variety, but one with the best vigour “I’m more interested in the speed of growth rather than out and out yield. I don’t want it to be sitting here waiting and waiting for all the pigeons to get it and all the other

issues that

may arise. Which is the quickest variety, which one really performs and gets away? Sealands Farm is quite unique in that it hosts one of very few OSR trials. Currently, it's like throwing a dart at a dart board and choosing a variety. It's getting very difficult to choose OSR nowadays."

Moving onto the cover crop trials, we first look at a mixture of radish, phacelia, black oats and vetch. A combination of materials that will help soil structure, which is the aim on farm (if you can get it established).

Steve explains his thoughts on tillage radish:

"Tillage radish has a big root but when it starts to rot, it leaves a tube of rotting material. So unless you are going to get rid of it, it's just going to remain there. This invites slugs. If you have a cereal crop next, slug pellets might be needed."

They also have nitrogen fixing mixes on trial: berseem clover, phacelia, and vetch. "It's important to ask yourself, what are you trying to do? Improve soil structure, fix N or something else?"

On farm, Richard has a base mix of phacelia and linseed. He then adds to them depending on what he is trying to achieve. "Unless you ask that question, you will buy an expensive pack, how is that going to pay for itself?"

Thoughts on other species include:

Westerwolds Ryegrass with Forage Rye

"Relatively easy to establish, very quick growing. Can mix other species in there like crimson clover and phacelia. Grass has been forgotten or left aside for arable growers." As explained later on, grass can be incorporated

without a loss in profit.

Vetches

“Common vetch in the spring will take off and be 2m tall. In winter it sits in the ground with fairly good growth. It has a beautiful root structure and nodules. Consider if you want lower biomass in the spring. Which vetch is going to grow when you want it to?”

“Hairy vetch has a lot more top growth. The rooting is no more than common vetch. If you want to drill into biomass this might be one of interest.”

“Hungarian vetch, even less biomass with larger roots.” Could this be better for your system?

“Ultimately” Steve says, “Don’t buy a bag that just says vetch. Ask what vetch? Biomass for grazing? Less biomass and more rooting for the ability to drill? Keep asking questions.”

Phacelia

“Fantastic for mycorrhizal fungi – worms love it. You can direct drill straight into it. With windy weather in the past, we haven’t been able to spray it off but have been able to direct drill into it and spray it off afterwards. The topsoil is nice and friable, it’s easy to grow, full of water, and if it is small enough, will die off in the frost; if it flowers, it can survive -2 degrees.”

Crimson clover

“Clovers are a little more tricky to establish and tend to be slower growing. Crimson in this case is the most prolific, come spring it will explode. Its red flower will also attract a lot of insects.”

Steve continues: “Growing in a system with plenty of nitrogen, clover is lazy, so might not have nodules. It can be slow to start and produce nitrogen. My observation with clover is that they are very greedy and keep all the nitrogen for themselves. Vetches, on the other hand, drop their nodules and the other crops get that supply of nitrogen. Beware that clover can dominate and will take out the grasses.”

So, in summary, and as Steve puts it, Richard is growing “a sweetie shop of cover crops.” His advice is, “You must ask yourself: what mix do you want and at what cost? If growing cover crops, which one and what for? Is it earning its keep? How much N is produced in the crop’s biomass? If the crop has good vigour and performs well it might be good to incorporate on farm.”

Cultivation: roots, slugs and sugar beet

In terms of cultivation, Richard is a big fan of direct drilling. When direct drilling wheat, he believes it is important to see what is happening underground: what is the root depth? Taking stock of root depth and maintaining that attention to detail during crop growth is essential to determine the next steps in terms of cultivation.

For the farm, dry and windy weather can be a challenge. “Root development is critical. When you get a block of dry weather and blowing winds, wheat needs to have the deepest roots possible. We were seeing crops get away very quickly, but the roots were not deep enough to cope with the drought. Putting a cultivator through meant roots were much shallower - in this instance, the direct drill was best”

The farm also keeps an eye on slugs “on the other hand, the slower the wheat is to get away, the more prone we are to slug damage. Slugs will live under the OSR straw debris over winter.”

To combat this, Richard “breaks up the stems and spreads evenly. The smaller we can break them up, the better.”

Richard has also trialled strip tilling maize and sugar beet which has had its challenges. For example,

“In the first year, we had square-sided sugar beet because the strips were too narrow.” However, after widening they can now accommodate the “football shape” as well as reduce their herbicides “from 5 passes down to 2.”

Having the strips of untilled soil also meant trafficability was improved, building resilience into the soil and enabling lifting when other fields struggled due to poor soil structure.

Forage rye, westerwolds and battling perennial ryegrass

Ultimately, Richard has tried a lot which didn’t work out, but he’s kept at it. One outcome which has surprised him the most was the success of forage rye which he believes is massively underestimated. In one of the fields we went to, Richard explained, “the forage rye was planted in early September and already you can start to see the root mass that we’re generating. It’s full of roots. The soil structure here is good down to the rock pieces. That’s what we’re trying to do, get this type of soil structure.” As an extra income stream, Richard either takes a cut for silage or grazes, ensuring to move stock on in wet conditions to avoid undoing all the good work he’s built up.

Looking to improve the soil structure even further, Richard planted the forage rye together with westerwolds. He found that they were able to harvest the westerwolds a fortnight earlier due to the ability of the forage rye to get away in the spring creating its own microclimate which Richard believes benefitted the westerwolds.

Finally, we heard about Richard's problem with persistent perennial ryegrass. In this instance, he introduced an annual ryegrass to outcompete the perennial. "Putting in a bully to outcompete a bully". It worked and Richard is now able to include it within the arable rotation without generating a loss. This allows a rest period within the rotation to build fertility, stabilise soil structure and generate a bit of extra cash from silage or grazing. "In the spring, the field will be returned to arable with no problems." Essentially maintaining the balance of farming resiliently: optimising soil health and crop yields while sustaining a viable business.

As Richard navigates his way through the unpredictable nature of the weather, he acknowledges there's still a lot to be discovered. Farmers are never short of challenges and the past year could perhaps be described as one of the most challenging; compounded by the fact many of the challenges were and still are completely out of our control. We can't rely on the weather, increasingly so, however, prioritising soil health as perfectly exemplified by Richard, can better equip us to respond and adapt. When we get to know our soils, monitoring how they behave in certain conditions and how they respond to our actions, we are better prepared and forearmed to make decisions that will affect future harvests and pocket.

Through trials and problem solving, Richard together with Steve have implemented more diversity and reduced inputs without damaging profits. A big resistance to straying from our well-known and “safe” rotations is often down to “how will it pay for itself”. Richard and Steve have shown that they’re not radical in their rationale for cover and companion crops, the bottom line is it has to pay. The most exciting take home from the day is they didn’t give up: they’ve found the right species to incorporate, the soil health on farm is improving and crop yields are directly benefiting. It was a truly inspiring day and a masterclass in perseverance. Richard hasn’t made it look easy by any stretch but as he puts it “we’re just learning all the time.”

