Guided by the future

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Roots Farm feature

A Shropshire farming family is shaping their potato business with an eye firmly on the future so that it's ready to deal with the challenges ahead, including ensuring they have an adequate supply of water. *CPM* pays them a visit.

By Lucy de la Pasture

A crystal ball would be one of the most useful tools for agribusinesses. Even though dealing with the unexpected is part and parcel of farming, right now change is coming from all directions — political, economic, technological and social with a large pinch of climate change to factor into the mix.

Shropshire potato grower Richard Solari predicts that as well as farming without subsidies, the future is one where glyphosate will be a dim and distant memory and water will be scarce. All of these are resources on which farming has become reliant, he says.

Richard was speaking to a group of delegates, all with an interest in water; including fellow growers, the Environment Agency and all the agents in between that help facilitate the procurement of abstraction licences, advise on water use and provide irrigation equipment. The ensemble was touring Richard's 530ha farm at Beckbury, near Shifnal in East Shrops during a visit organised by the UK Irrigation Association.

While showing us one of the farm's three reservoirs, Richard says, "We've reached a turning point in humanity and instead of being guided by our past, we have to be guided by the future."

Global warming

He was drawing on the words of Danish-Icelandic artist Olafur Eliasson, known for his artwork that challenges people to change the way they think about issues such as global warming. The power of the words caused him to reflect on the meaning of them and how they may apply to agriculture and the family business in particular.

"I've always been slightly sceptical about climate change, but I now believe it's happening. We're already in it and we've all got to start to behave differently," he says.

For reasons that may have started off being driven more by economics than environmental reasons, the farm installed a 50kW bank of solar panels to replace a diesel-powered pump at the 64,000m^2 (14M gallon) reservoir five years ago.

"On a sunny day we generate enough natural energy to put some into the grid. This year the solar panels have, after five years, paid for themselves, so now we're effectively being paid to irrigate," he adds.

The change to a solar-powered pump also changed the farm's irrigation habits. "We used to irrigate a lot at night because the wind speed was lower, but we do more now during the day to make use of the solar energy."

Within the past three years, the farm has also installed a more energy efficient horizontal borehole electric pump at its biggest reservoirs which has reduced energy consumption by a third.

"Now storage battery technology is advancing we'll probably install ground-mounted solar panels there as well. It's nowhere near the mains electricity and solar energy would replace the diesel generator currently powering the pump," he says.

Water is absolutely key to production on

Richard Solari says the solar installation paid for itself in five years, so now he's effectively being paid to irrigate.

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the farm's light sandy loam soils, explains Richard. "Irrigation is already the most important operation on the farm and in terms of financial return, it's the singly most rewarding."

The farm's cropping revolves around potatoes for targeted outlets including Accord, Sagitta and Maris Piper. Sagitta is becoming a firm favourite with chip shops, who are paying a premium of £20/t over Maris Piper because of the variety's flavour and good frying characteristics, he notes.

Richard wouldn't be able to grow packing quality potatoes on the farm's soil type without his three Otech Linear Irrigators — the first machine purchased in 2001 the other two in 2006 and 2012. The shape of the fields on the farm has evolved over the years to fit the span of the gigantic boom irrigators, which Richard finds provide the scope to apply water 'little and often' and in a gentler way. The farm still operates hose reels and rain guns, necessary for the more awkward shaped or outlying fields on the farm.

Even though many of the hedges have been taken out across the farm, Richard doesn't believe there's been a big environmental impact from doing so. Viewed from the air, the arable land is an island surrounded by woodland, he points out. Small copses and wildlife areas have been established in some of the more awkward areas to provide some compensation and the abundance of cover crops in the rotation provide an additional habitat for wildlife and insects.

But looking towards the future, Richard sees water playing an even bigger role as the farm adapts its rotation to meet the many changes that are on the farming horizon. He views subsidies as one of the worst things that has happened in farming because it's meant businesses have been able to survive without necessarily turning a profit, allowing them to take their eye off the ball which should be market-driven production.

"One of the decisions we've made is that we'll be growing crops to feed humans, not animals, when we reach the era where there are no farming subsidies. On our land where we're lucky if we produce 10t/ha of wheat, we'll just be breaking even without the subsidy, so we need to bring in other crops. Although this won't happen until 2022, we're starting to make the change gradually and have rented land to a local carrot producer for the past two seasons."

As well as carrots, the Solari's intend to bring another water-dependent crop into the rotation, salad onions. "The carrots and onions will be at the expense of winter barley and oilseed rape, but it's a condition that the carrots must be harvested in good conditions by the end of Sept," he comments, recognising that any soil damage would have a lasting impact on the rest of the rotation.

Two rotations

The farm will effectively run two rotations. On the land where early potatoes are grown, these will be planted after a one-year grass/clover ley and followed by winter wheat and then winter barley. The second rotation will be a one or two-year grass/clover ley, followed by potatoes, winter wheat, either carrots or spring onions and winter wheat.

"The farm is already in the Countryside Stewardship Scheme and there are indications that under the new Agriculture Bill there will be a revised scheme where one option may be a two-year grass/clover ley. This will be the decider as to whether we have a one or two-year grass/clover ley in this rotation," he explains.

Richard is very aware that by increasing the cropping dependent on irrigation at a time when water is predicted to be in shorter supply means he will need to invest in building another reservoir. He took the group to the highest point on the farm and very candidly asked for advice — which gave rise to some interesting interpretation of the rules governing abstraction, particularly regarding at which point water falls under the governance of the Environment Agency.

Lifting Maris Piper in good conditions and Sept sunshine at Heath House Farm.

Three Otech linear irrigators make it possible to produce packing quality potatoes on the Solari's sandy loam soil in East Shrops.

"My thoughts about building a reservoir here is that the energy cost will be less because I'll only need a relatively small pump. The elevation above the irrigable land below is about 20m which means I'll have two bar of pressure already. I'll be able to winter fill the reservoir by pumping using solar energy in the winter, which is free."

Richard has some very strong views about soils and uses colourful language to describe the state of much of the UK's soils. He believes they've been degraded over the years, particularly regarding soil organic matter content, and he suggests this is the main reason for the nation's yield plateau.

"Looking after the soil is something my father was passionate about, I'm passionate about and so are my sons, Ed and Tim. We use green manures and cover crops extensively to keep adding soil organic matter and we aim not to have any bare ground over the winter."

As well as the grass/clover leys, a biofumigant crop is used widely as part of the farm's integrated approach to pest management. "We plant the 'Hardy' mix, named after our agronomist Luke Hardy, who developed it as part of his MSc at Harper Adams University. The crop is a mixture of mustard, oil radish and rocket — all these species are high in glucosinolates which, when the crop is chopped and incorporated, release isothiocyanate gas and reduce the population of nematodes in the soil.

"When it gets frosty, the first to go is the mustard, then the oil radish and then, last of all, the rocket," he adds.

Richard believes that to get maximum value out of a cover crop it's important to treat it as a crop and that means feeding it. He showed the group a biofumigant crop after barley which had been in the ground ▸

Richard Solari shows the group a biofumigant cover crop, explaining it's used in the rotation to replenish organic matter and as part of an integrated approach to managing nematodes.

▸ for about a month, explaining it had received an application of nitrogen and sulphur to help the crop build the biomass needed by the middle of Nov.

"Cover crops provide a habitat and food source for insects as well as mopping up nutrients, preventing leaching and soil erosion so they're of real benefit to the farm," he says.

A couple of fields away a self-propelled sprayer is weaving its way up and down a field of OSR which is being hammered by cabbage stem flea beetle. With obvious frustration Richard waves a hand at the sprayer and says, "They've banned us from using a seed treatment that may have had some not-so-good effects and now we're having to apply something that's much worse over the top and it will kill just about everything. I honestly believe that in five years there won't be any chemicals left worth putting in the sprayer."

A little further on, the farm's one full-time employee is operating the Lemken Solitair 9 combination drill, which is the key piece of tillage equipment on the farm. Richard believes the soil health arguments for min and no till are "nonsense" and that it's absolutely crucial for plants to be able to get their roots down as far as possible.

"Yields are lower and inputs higher so I can't see how minimal cultivations are any better for the environment. Let's not pretend, glyphosate will go and then it will be impossible for growers using these systems to manage without it. All the min till equipment will become worthless overnight," he says.

Full of earthworms

Richard is adamant that a good rotation which includes grass/clover leys, constantly replenishing organic matter and working the soil appropriately in the right conditions are the best ways to keep it in good heart. His own soil is full of earthworms, rather debunking the theory that min till is better for them.

"My brother (Mike Solari) has twice held the Guinness world record for winter wheat on his farm in New Zealand. He runs a nine-year rotation which includes a three-year grass ley and he ploughs and deep subsoils routinely. He believes that the roots will keep going down if they don't meet any resistance," he says.

Desiccation is another area where Richard isn't going to be seduced down the same road as many other potato growers when diquat is no longer available next season. "I won't flail, I've tried it and it can turn into a disaster if it turns wet and you're having to drive through the ridges. It also a great way to disturb the stems and throw any infection all over the place," he adds.

Instead he's likely to use a programme of the two alternative desiccation products, Spotlight Plus (carfentrazone) and Gozai (pyraflufen-ethyl) in tank mix. "At Potatoes in Practice the best results were from using 1.0 l/ha Spotlight plus 0.8 l/ha Gozai, followed by 0.6 l/ha Spotlight plus 0.8 l/ha Gozai. Unfortunately the two manufacturers aren't keen to work together to support the mix so if there's a problem with translocation then it will be at the grower's risk, which is disappointing," he says.

Finally framing his thoughts on being guided by the future, Richard says that the least important thing is politics and the most important thing is food production. And it's with that very much in mind that he and his two sons are preparing a business that hopes to survive with no subsidies, no glyphosate and a scarce supply of water. ■

A Lemken Solitair combines six operations into one and does much of the work on the Solari's farm.