

Strip-Till Conversion Mellows Tough U.K. Soils

Turning to a modified strip-till setup that includes cover crops, Alex Shutes is saving time and money and seeing improved soil conditions with little or no yield drag.

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A FEW YEARS ago as circumstances changed on his farm, Alex Shutes faced the task of raising several spring and winter crops in a tillage-intensive system as a one-man operation. It seemed like a daunting task.

That's what drove the 28-year-old grower to give strip-till practices a try on his Essex, U.K. farm a few years ago. Shutes raises oilseed rape, wheat, winter and spring barley and spring beans in a 7-year rotation on his 500-acre farm, "with the mindset of not being afraid to chop and change crops depending on prices, weather or any other reason," he says.

His first wheat crop is grown as a low-pesticide biscuit wheat destined for Heinz to produce baby-food products, and the second crop is for feed. Spring barley is grown for malting and hybrid winter barley is grown for feed. Spring beans are grown for human consumption.

Shutes says the historical rotation of wheat/wheat/oilseed rape, with barley seeded

in a few places here and there, was lengthened to get different plant species growing successfully across the farm every year to improve soil and crop health and diversify his weed-control program.

Lots of Labor. Soils vary considerably, from light sandy loam to gravelly sandy clay loams to both clay loam and heavy Essex clays. The tillage system used by Shutes included plowing, furrow pressing and power harrowing, followed by a tine drill and landroller.

The landroller was used to consolidate soil after drilling mainly to conserve moisture, push in stones and create a finer seedbed so pre-emergence residual herbicide applications would work better.

"It was quite labor intensive and used a considerable amount of fuel and wearing metal," Shutes says. "It was a fairly reliable system that worked, to a point, in wet years across all of our soil types."

But circumstances on the farm required Shutes to devise a system where one person could do the majority of planting, spraying and fertilizer application, while reducing planting cost during a time of lower crop prices. He wanted to take a longer-term view of improving soil health while maintaining or improving yields.

Three years ago Shutes bought a 10-foot Sumo DTS3 drill to replace his aging Weaving tine drill. "The initial purchase price of the drill was a big cost for us but we needed a new drill anyway," he says. "Whether we had bought a tine drill again, a combi drill, a cultivator-type drill or a full no-till drill, most

would have cost us \$30,000 to \$50,000, so price wasn't as big a factor as getting the right drill for what we wanted to do."

One-Pass Efficiency. The type of strip-tilling Shutes does doesn't totally resemble what's done in the U.S., with strips of soil being cultivated in fall or spring ahead of planting. In the U.K., Shute's seeder, pulled by a Claas Arion 630 tractor, creates a strip of soil, sows the seed and closes the strip in one pass.

During seeding, a cutting disc cuts through the residue and also cuts into the surface of the soil. A ripper tine that can be set 1-10 inches deep cultivates a strip of soil. The seed is placed behind the ripper tine using a "seeding coulter" that can be either 5 inches wide for cereals or 1 inch wide for field beans or rape.

The seeding leg is followed by two covering discs that spread soil back over the seed, and rear press wheels consolidate the soil around the seed and help regulate seed depth as they follow the contours of the soil.

Shutes says the Sumo DTS3 can drill into nearly any type of seedbed, which was useful a few years ago when he was still required to incorporate crop residue before planting low-pesticide wheat on about 20% of his acres. All other crops are sown directly into stubble or an overwintered cover crop. Shutes says the contract for his wheat was changed and he no longer is required to plow ahead of planting.

In his first summer with the Sumo he drilled all of his oilseed rape and cover crops on ground going into spring cropping the following year. "Direct drilling in the spring is very different to our previous system, and I've found a lot more patience is required in difficult springs. Heavy land in a wet spring, plus high slug pressure, has made that very clear.

"And we found quite quickly that the DTS wasn't all too keen on handling the large amounts of straw that were being seen after harvest — especially when drilling shortly after the combine had been through the field, as it didn't take much for the drill to

block up," he says. "The issue was improved by cutting our stubble shorter, and, by the time we came to fall drilling the stubble had become brittle and wasn't a problem."

Making Adjustments. He notes Sumo didn't ignore the problems he was having and provided him with modifications that improved performance, even in fields with lots of residue. Sumo provided spacers to fit on legs 3, 5 and 7 of the machine to push them back further to increase the space for trash to flow through the drill.

The company also added a new ripper leg with a cranked design rather than the original straight-down leg, which increased the gap between the ripper leg and coulter leg that had been prone to blocking up in wetter conditions.

Shutes didn't buy a straw rake with the drill but eventually found trash flow through the drill was better with raked stubbles.

"The main reason for buying a straw rake for us is that our current combine doesn't have a chaff spreader and we found thick rows of chaff and short straw every 18 feet in fields that were direct drilled into stubble. This caused issues with nitrogen (N) tie-up, a greater number of slugs and very wet soil underneath the chaff that smeared.

"Other parts of the field with no chaff had nice tilth. So we ended up with thinner crop on those thin strips where the combine had been."

Shutes bought a 20-foot Weaving stubble rake to spread straw and chaff more evenly, kill a few slugs and destroy some slug eggs, to start breaking down previous crop residue and let air into the top of the soil.

"I haven't seen any instantly visible changes in our soil health but have seen a few examples that we're heading in the right direction," he says. "A good example would be in some of our heavy fields that plowed up in slabs and took a

lot of power-harrowing to break into a cloddy seedbed in a dry year or would be a smeary mess in a wet year.

"They were drilled in one pass into a nice tilth in the top 2 inches, saving considerable amounts of time and money. I've also found direct-drilled fields let us to get back in there much sooner when spraying or fertilizing than with plowed fields. That can be very beneficial when spray days are at a premium."

Shutes estimates he's been saving roughly \$78 an acre in establishment costs compared



LESS DISTURBANCE. Heavy soils and wet conditions can make seeding difficult for Alex Shutes, but the drill he's using clears enough of a path to seed crops while still leaving residue. Shutes estimates he's saving \$78 an acre in establishment costs and has cut fuel use in half since switching from conventional tillage to a modified strip-till system 3 years ago.

to the previous system. Fuel use can be cut almost in half.

Shutes says average yields have stayed the same across different crops but he hopes they will increase as soil health improves. "The fact that we're saving money on establishment, though, means the balance sheet does look better in terms of cost per ton. But investments like the new drill, a new crop sprayer and a new combine eat into funds considerably."

Plunging into Covers. After doing a lot of research, Shutes started seeding a

but is still determining what works best with his rotation.

"Before spring barley I try not to use too thick of a grass species so the soil has a chance to dry out in the spring. Grass covers create quite a mat that keeps the soil too wet, and grasses can increase the green bridge for aphid carryover between crops, which I want to avoid," Shutes says.

"A standard mix before spring beans would be oats, radish, linseed and phacelia, perhaps with a few other things thrown in occasionally. Before spring barley I would use radish, peas, maybe a small amount of forage rye, phacelia, millet and linseed. As long as something is growing I'm happy."

Shutes says his move to volume hybrid barley provided his best ever yield of winter barley in 2017 at 134 bushels an acre, even with a dry spring, but many of his other crops suffered due to alternately dry and wet conditions, as well as slug pressure.

He also used a liquid fertilizer system installed on the drill for the first time in 2017 to apply 14-7-7 for oilseed rape. The system includes a 250-gallon front tank with a hydraulic pump that sends the liquid to a manifold on the drill which is then diverted to each one of the nine drill legs down nine different pipes.

The application rate is adjusted by speed, pressure adjustment with a manually adjustable valve and different-sized nozzles. "The liquid is fired down in furrow behind the seeding coulter to be mixed with the seed," Shutes says. "This represents a few adjustments from our original setup and it is working well now."



Alex Shutes

"Fields that would need multiple cultivation passes to break clods down to create a seedbed now drill direct with a nice tilth around the seed in each strip..."

legume-free cover crop mix ahead of spring beans and a grass species-free mix before spring barley.

"I'm still very much experimenting, as cover cropping and spring drilling on heavy ground isn't easy. But you don't learn anything if you don't try things on your own farm," Shutes says.

Shutes has been seeding cover crops with the Sumo drill, sometimes passing over the ground with a straw rake beforehand to spread residue more evenly. He's tried a couple of different cover crop mixes



MAIN MACHINE. U.K. grower Alex Shutes replaced his aging Weaving tine drill with this 10-foot Sumo DTS3 drill. During seeding, a disc cuts through residue and into the soil surface and a ripper tine cultivates a strip of soil. Seed is placed behind it using a seeding coulter, followed by two covering discs that spread soil back over the seed. Rear press wheels consolidate the soil around the seed to help regulate seed depth.