

UNDER-SOWING MAIZE AIDS CROP SUSTAINABILITY

Under-sowing maize with Italian ryegrass delivers valuable spring grazing for youngstock but the bigger benefit for Herefordshire dairy farmer Chris Norman is making the primary crop more sustainable.

Milking close to 600 autumn block calved cows on a forage-based system at The Leen, near Pembridge, Chris Norman sees maize as integral to his operation.

The farm grows around 45ha each year, with this contributing around half of the winter forage ration alongside grass silage.

Around two-thirds of the maize has been grown continuously on one block of land, with the remainder fitting into the grass rotation. For the last seven years, all the maize has been under-sown.

"We want to look after our soils and, with maize, that means avoiding bare soils over winter," says Chris.

"We're not growing cereals or any other crops, so grass is the only over-winter cover crop option for us.

"It might be possible in some years to establish grass in the autumn after maize, but we've found that under-sowing is by far the most effective option."

By under-sowing, the grass sward is in place as the maize comes off, eliminating any chance of bare soils. In an autumn like 2019, when wet weather created harvesting difficulties for so many, having a sward in place provided additional advantages.

"We certainly saw added benefits last autumn as rutting and loss of soil off the maize fields during harvest were greatly reduced due to having the grass sward under the crop," says Chris. "We had an inch and a half of rain around the time the maize was ready to come off but were able to harvest two days later with hardly any problems.

"In any year, the cover crop greatly improves the condition of the soil, helping to prevent run-off above the ground and providing stability, soil structure and improved soil biology below ground."

Whilst soil health, and keeping maize growing sustainable, is Chris Norman's priority, the Italian ryegrass cover crop does provide an estimated 2-3tDM/ha of spring grazing for in-calf heifers

or other youngstock, which on its own would more than cover the cost of the under-sowing operation and the seed.

"We'll usually take a first grazing in mid-March and a second bite at the end of April," says Chris. "If it's on the continuous maize ground, we'll spray off the sward in time to drill the next crop."

With soil health again the motivation, Chris has tried various methods of

reducing cultivations when establishing maize, including a direct drill into the sprayed off maize/grass aftermath, or sub-soiling and power harrowing.

Whatever the maize establishment method, the cover crop has for the last four years been sown using a custom-built inter-row coulters drill. The drill has been developed through collaboration between forage seed company Field



Field Options' Hurricane III mixture comprising persistent Italian ryegrass and Westerwolds varieties has been one of the top performers in the HAU grass mixtures trials.

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Italian ryegrass established under the canopy has no detrimental effects on maize crop performance.

Options, the Wye and Usk River Trust and local contractor Roy Price and is proving to be capable of consistent results.

"We'd previously used a spring tine drill for establishing the cover crop, which worked reasonably well but tended to leave patches where seed didn't germinate," says Chris. "Since we've used the inter-row coulter drill, we've seen maximum seed germination across the fields and we've not looked back."

With trials and development work with the inter-row drill on-going since 2016, considerable knowledge and experience of the practice has been built up, as Field Options' Nick Duggan explains.

"Optimum timing for drilling is when the maize is at the six to eight leaf stage – or one week after the last herbicide application. By this stage the maize is established, so able to cope with competition from the cover crop. There will also be minimal effect from any residual herbicides.

"Drilling the cover crop in rows between the maize means there is space between plants, again minimising the effect of any competition. Using an effective double disc opener and press wheel arrangement also delivers the required seed-to-soil contact that ensures germination in what can be dry conditions.

Nick adds: "To date we've found that the most effective cover crop is

an Italian ryegrass blend, as it has the vigorous growth characteristics required for successful establishment in the conditions. It will then provide a crop that can offer out-wintering potential and/or good spring grazing."

The team are continuing to evaluate other species, including legumes, herbs and vetches. Mixed species mixtures are also available. However,



Rye is a good option for September establishment, but it is important to use proven forage varieties and not grain rye.

the Italian ryegrass blend has proved nearly 100% successful and produces up to 3t/ha DM by the end of March, at 12ME and 12% protein. This equates to approximately 1,500 ewe grazing days, or 300 heifer grazing days, per hectare, so valuable extra production.

As an all-in service, inclusive of seed and supporting expertise, Field Options quotes in the region of £80 - £100/ha, with actual price depending on variables such as field size, location and seeds mixture choice. In most cases, the extra forage produced should more than cover the cost of the operation. The environmental gains will then provide a far more significant pay-back.

Compliance

Although future agricultural policy remains uncertain, there is little doubt that there will be greater imperative to farm with high levels of environmental responsibility. The common view is that it will become mandatory to avoid bare ground over winter.

As a catchment adviser for the Wye and Usk Foundation, Ben Nott's role is to work with farmers to achieve the good agricultural practice that ultimately keeps silt and sediment out of rivers. However, his approach is more about promoting the benefits of good soil health.

"Establishing a cover crop certainly helps to avoid soil run-off, and that is

about protecting the farm's greatest asset," he says. "With foliage on the surface, you are reducing the impact of rainfall, and then the roots under the ground create channels to allow effective water infiltration.

"With live root structures in the soil, the organic matter increases and there will be higher levels of microbial activity, and that will mean more earthworms which in turn return more organic matter to the soil. A healthier soil is not only better for the environment, but it's also more productive, so cover crops really are a win: win."

Under-sowing maize – top tips

- Avoid fields with heavy grass weed burden
- Inter-row coulter drill, not broadcast
- Drill at 6 – 8 leaf stage
- Work with an experienced agronomist
- Use a proven cover crop mixture



Root structure from an under-sown Italian ryegrass plant, which creates soil stability and allows penetration of rainfall into the soil as opposed to damaging run-off.