

Unlocking the potential of heavy soils dairy farms



The average herd size on Teagasc Heavy Soils Programme farms has increased by 32% since 2011

Improving soil fertility, grazing infrastructure, grazing management and herd genetics are key priorities in the Teagasc Heavy Soils Programme

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One common question when dealing with farms which are of moderate to poorly drained soil status is: “Does my focus need to be different given the fact I have a heavy farm?” This sentiment often hinders progress and leads to inefficiencies.

The Teagasc Heavy Soils Programme (HSP) over the past decade has shown that the fundamental management practices to achieving farming success on these soils are similar to those on free-draining soils. However, they require adjustments to take account of prolonged periods of wet weather and poor grazing conditions.

Key lessons

At the outset of the programme the primary focus was land drainage, but it soon became obvious that although targeted land drainage

would make up part of the solution, at individual paddock level it was a combination of management practices that would play a significant role across all the farms. This involves improving soil fertility, grazing infrastructure, grazing management and herd genetics.

Correcting soil fertility

As part of the programme, a soil sampling campaign was undertaken to monitor soil fertility status. All paddocks on the participating farms are now sampled annually.

Soil sampling has shown that most HSP farms are below optimal soil fertility levels. The sampling interval and intensity has allowed soil fertility to be addressed on a paddock-by-paddock basis.

Lime and fertilizer application strategies have been developed with a focus on the under-performing sections of each farm. Increasing soil fertility on these soils brings particular challenges in terms of nutrient response rates. An intense regime of data

collection at a paddock scale in terms of nutrient inputs (chemical/organic fertiliser, concentrates) and off-takes allows for an in-depth understanding of changes in soil nutrient levels when compared with annual soil tests over an extended period.

Targeted nutrient improvement measures across the HSP farms has seen them move from a position where in 2013 only 2% of paddocks were optimum for pH, P and K to the current figure of 30% for this measure.

There remains a lot of room for improvement – a major issue with building soil fertility status on such soils is a disparity in responsiveness to applied nutrients or lime.

Regular soil sampling means nutrient allowances can be targeted at the most responsive farm areas to ensure best return. Soil fertility improvements have delivered a large part of the increased grass grown on each farm. HSP farms on average have increased grass grown from 10.6T DM hectare in 2011 to 12.5T DM hectare in 2022.

Increasing grass utilisation on grassland farms is a key driver in increasing net profit. Improved grassland management relies upon robust grazing infrastructure –

suitably sized and shaped paddocks with multiple access points serviced by roadways of sufficient quality and adequate drinking water.

On heavy soil farms, grazing infrastructure is particularly important to maximise grassland utilisation during periods of wet weather. Appropriate roadways, paddock access and water trough provision allows for a flexible approach in terms of grazing allocations and aggressive on/off grazing where required.

Farm audits

The HSP farm audits were carried out by each farmer along with HSP staff and aimed to identify any issues around grazing infrastructure under the following headings: paddock size, shape and access points; extent, quality and condition of the farm roadway network; access to drinking water in paddocks.

A number of issues around grazing infrastructure were apparent on all farms.

Many of these were relatively minor in their own right, but combined to create difficulties in grassland management and utilisation, animal performance and labour input, particularly in periods of poor weather and difficult grazing conditions.

Improvements made to grazing infrastructure allowed the HSP farms to achieve 7.6 events (grazing and silage events) per paddock on average in 2022. Better grazing infrastructure has also allowed for better grassland management. On average, 35 grass walks were completed across each farm with an average pre-grazing yield of 1,444kg DM/Ha.

When farmers have a greater focus on grazing it is inevitable that there will be prolonged periods of poor weather where cows will have to remain housed.

This means 70% of all silage made needs to be high quality (75DMD) for feeding to milking cows and young stock. There should be also be a 20% silage reserve in place at all times on these farms to cover these adverse weather periods.



Better grazing infrastructure has also allowed for better grassland management

Improving Animal Performance

Since the beginning of the programme, herd size on the farms has increased by approximately 32% from the 2011 level.

There has also been a corresponding increase in milking platform stocking rate from 2.12 to 3.03 LU/HA, with a whole farm stocking rate of 2.07 LU/HA.

Throughout the duration of the programme a large emphasis has been placed on improving herd genetics and fertility performance.

Herd EBI has increased from €84 in 2011 to €188 in 2022 (EBI figures reflect the August 2016 EBI base change of -€71 applied universally).

The six-week calving rate has averaged 81% over the 2020-2022, up from 63% in the early years of the programme.

In 2022, HSP herds on average produced 520kg milk solids per cow on 1,106kg meal fed. Overall kg of milk solids per HA (MP) has increased from 850kg in 2011 to 1574kg in 2022 ultimately resulting in improved efficiency and profitability.

This increase can be attributed to better genetics, improved fertility, increased grass utilisation and an increase in stocking rates in line with the improvements in grass grown.



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'I was leaving money behind



James McMahon and his Teagasc advisor James O'Donoghue

Farmer focus: James McMahon

James McMahon has seen his herd's milk performance increase substantially since joining the Teagasc Heavy Soils Programme

James McMahon, who farms near Swans Cross in Co Monaghan, joined the Heavy Soils Programme (HSP) in 2015. He currently milks 115 cows on a 28-hectare milking platform while farming 79 hectares in total. "The farm is not only heavy in nature, but is also fragmented which has its own challenges," explains James.

The farm performance wasn't where he wanted it to be from an animal and grassland performance perspective. After he joined the HSP, a plan was devised to correct soil fertility, improve grazing infrastructure, identify paddocks for land drainage works, and also improve herd genetics and fertility performance.

"Along with the HSP team we put in place a long-term plan for the farm which I have been working on over the last number of years," says James.

On grazing, he placed a strong emphasis on improving the soil fertility status. This has improved dramatically, but continued work is required to ensure the percentage of paddocks optimised for pH, P&K continues to increase.

For grazing infrastructure, additional main roadways and spur roadways have been added. And fences have been amended to allow multiple access points into individual paddocks. "If you can't get to the paddock easily you just won't get cows to grass on those wet days."

Soil analysis and classification from the HSP team identified that a shallow drainage system was required in the form of collector drains and gravel mole drainage.

"Unfortunately for me, this is the most expensive form of drainage but it is working very well in the parts of the farm where I have completed it," says James. "We try to complete 2.5/3 hectares a year and then also incorporate this into our reseed programme. We grew 12.8T DM/Ha in 2022 which we are very happy with and it's reflected in the animal performance improvements."

Breeding decisions

"Prior to joining the programme, herd breeding decisions were often outsourced with my only real concern being that we had cows with plenty of milk."

Until 2015, the herd produced 408kg MS / cow at 4.18% butterfat and 3.32% protein on with a calving interval of 430 days.

"I was leaving money behind when I looked at what other herds were achieving so something needed to be done to improve fertility and milk performance," says James. "It was slow in terms of progress up until we made the decision to buy in high EBI in-calf heifers over the last three seasons."

With the help of the local Teagasc advisor, James

compared to other herds'



James McMahon and James O'Donoghue on the farm near Swans Cross in Monaghan inspect new roadways that have been added as part of the Teagasc Heavy Soils Programme plan for the farm.

O'Donoghue, clear criteria were identified for the type of stock to be purchased. The emphasis was on fertility and solids, AI-bred, calving in February and high health status.

"We identified a number of groups of stock in the south to look at that fitted the criteria with regards genetic potential. I won't tell a lie – I wasn't so sure when I looked at the first group of stock," says James.

Herd EBI

"They were a lot different from what I was used to looking at, but after seeing the herd of cows and the performance figures they were achieving it did put my mind at rest. We purchased 57 in-calf heifers over the last three years and sold poor performing cows."

These changes have seen the herd's EBI jump from €84 in 2018 to €166 in 2023. The herd calving interval is now down 378 days and there's a six-week calving % of 65%.

"I would like the six-week calving percentage higher and we are continuing to work on that," says James.

There was also a dramatic increase in the herd's milk performance in 2022 when the cows produced 498kg MS at 4.20% butterfat and 3.54% protein on 1,200kg of meal.

That is an increase of 90kg MS / cow on 2015 levels or an additional €450 per cow in additional milk sales based on 2021 milk prices. "It's an additional €51,750 in milk sales when you multiply it up across the herd. "It's very much about focusing on the simple things and doing them well," concludes James.

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