

# Establishing the baseline

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Central to the Signpost Programme is a network of demonstration farmers – the Signpost Farmers – who are working with their Teagasc advisors to incorporate a range of research-proven climate mitigation technologies into their farming systems.

This article highlights the performance of these farmers in 2021, using data gathered by Teagasc National Farm Survey farm recorders. The data was subsequently analysed, with greenhouse gas (GHG) emissions calculated, using Teagasc GHG models.

### About the Signpost Farms

There are 119 Signpost Farms, including 50 dairy, 24 suckler beef, 16 dairy calf-to-beef, eight sheep, eight tillage, two pig, and one poultry farm. There are 10 additional farms including three Teagasc colleges and three independent colleges, along with a number of Teagasc research demonstration farms. Five of the 119 are organic farms.

The locations of the farms can be seen in Figure 1. You can find out more details about the Signpost Farmers in your area on our webpage [www.teagasc.ie/signpost](http://www.teagasc.ie/signpost).

### GHG emissions in 2021

The need to reduce GHG emissions from our farming activities was highlighted by the recent Government

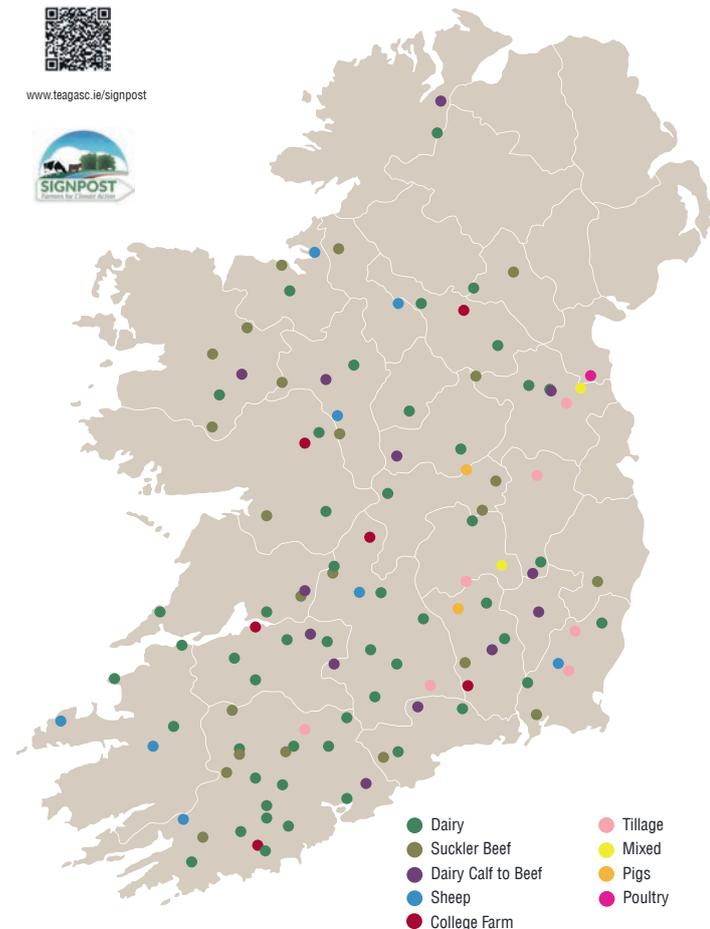
announcement of a 25% reduction target for the agricultural sector.

One of the objectives of the Signpost Programme is to work with the Signpost Farmers to reduce GHG

emissions in line with national policy objectives.

As with any change process, it is important to know your starting point. We now have this information for the

**Figure 1:** Signpost Programme demonstration farms.



**Table 1:** Total GHG emissions, GHG emissions per hectare and GHG emissions per kg output for Signpost Farms for 2021.

Enterprise	Number of Signpost Farms	Hectares farmed (ha)	Average livestock units (LU)	Total GHG emissions per farm (tonnes CO <sub>2</sub> -eq.)	GHG emissions per hectare farmed (tonnes CO <sub>2</sub> -eq. per ha)	GHG emissions per kg output (kg CO <sub>2</sub> -eq.)
Dairy	45	95	217	988	10.4	0.93 (per kg FPCM)
Beef	35	62	117	429	6.8	9.2 (per kg liveweight)
Sheep <sup>1</sup>	8	84	94	245	2.9	11.0 (per kg liveweight)
Tillage <sup>2</sup>	6	127	-	188	1.5	-

<sup>1</sup> The eight Signpost sheep farmers include two hill sheep farmers.

<sup>2</sup> One of the Signpost tillage farmers has a small livestock enterprise; 92% of total GHG emissions relates to tillage, with balance to livestock.

Signpost Farms, along with other key sustainability metrics.

As a farmer, the key statistic to watch is the year-on-year change for your farm. You don't need to measure yourself against other farms in terms of total GHG emissions, but you do need to track your own total GHG emissions and, where possible, take steps to reduce them.

**Where can farmers establish their GHG emissions?**

A useful starting point for Bord Bia Quality Assured farmers is to refer to your Farmer Feedback Report (which you receive once you complete the Sustainability Survey and are certified). This report contains your farm's carbon footprint figure and other key sustainability metrics. In the future, farmers will be able to access a new digital platform to view their emissions and sequestration position and develop a plan to reduce emissions with their advisor. This platform is currently being built by Teagasc, ICBF and Bord Bia.

**Fertiliser and nutrient use**

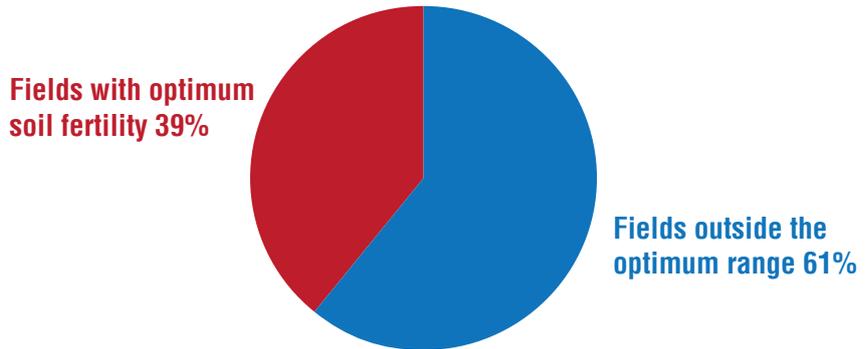
Nitrous oxide (N<sub>2</sub>O) is a potent GHG, with a warming potential 265 times greater than that of CO<sub>2</sub>. It accounted for almost 25% of total agricultural GHG emissions in 2021. Chemical fertiliser applications are the principal source of this gas (37%).

If farmers are to reduce N<sub>2</sub>O emissions, then they will need to reduce fertiliser use and increase the efficiency with which fertiliser and animal slurries are used.

- The highest fertiliser usage was recorded on the dairy Signpost Farms (but these farms were also more highly stocked).

- There is considerable scope for improvement in the efficiency with which fertiliser N is used on all farms. Dairy farms achieve the highest efficiency at 28%, but this is still below the target of 40%.

**Figure 2: Production optimised soil fertility (2,993 soil samples from 96 Signpost Farms).**



- All farms have made a start. Mitigation actions such as the use of protected urea, employing Low Emission Slurry Spreading (LESS) and application of slurry in the spring are becoming commonplace. But there is still room for increased usage of these technologies across all enterprises.

A number of Signpost Farms are already achieving targets in relation to nitrogen use efficiency, protected urea use, LESS usage, and spring application of slurry.

The challenge for the Signpost Programme is to convince more farmers to follow their example.

**Slurry analysis**

In early 2022, 136 slurry samples were collected from the livestock Signpost Farms. For many of these farms, it was the first time that their slurry had been analysed.

The results confirmed that they contained valuable nutrients (even more valuable this year due to high fertiliser prices) and Signpost Farmers were able to tailor/reduce their fertiliser applications during the year.

**Soil results**

As part of the National Agricultural

Soil Carbon Observatory (NASCO) research project, almost 3,000 soil samples from 96 Signpost Farms were gathered and analysed in autumn/winter 2021-2022.

Over 39% of these were classed as having “production optimised soil fertility.” This means that soil pH is above 6.3 and P and K indices are at 3 or 4. While this position is better than the position nationally, there is still scope for considerable improvement on many of the Signpost Farms.

**What next for the Signpost Farmers?**

We now have the baseline, or starting point, in terms of GHG emissions. Teagasc advisors are working with our Signpost Farmers to support them in adopting the proven mitigation technologies.

The availability of farm specific results will allow our advisors, working with their Signpost Farmers, to identify areas for improvement, before agreeing a plan of action.

Data is being recorded again on these farms in 2022, and once the data is available next year, we will be able to observe the impact of management changes on the sustainability indicators, including total GHG emissions, for 2022 versus 2021.

**Table 2: A selection of sustainability KPIs for dairy, beef and sheep Signpost Farms for 2021.**

Enterprise	Number of Signpost Farms	Fertiliser N use (kg/ha)	N use efficiency (%)	Fertiliser N spread as protected urea (%)	Slurry spread using LESS (%)	Slurry spread Jan. to Apr. (%)
Dairy	45	197	28	40	92	80
Beef	36	116	16	18	42	71
Sheep	8	78	19	18	50	25

**Table 3: Signpost Farms slurry analysis.**

Sample type	No. of samples	Available N* (units/ 1,000 gals)	Available P (units/ 1,000 gals)	Available K (units/ 1,000 gals)
Dairy (indoors)	52	10.3	6.3	24.8
Dairy (outdoors/washings)	16	4.0	2.5	11.9
Beef (suckler/ dairy calf to beef)	55	10.8	7.4	28.8

\* 40% availability assumed