LIFE Carbon Farming

Newsletter #2- November 2023

Welcome to the second issue of the Irish newsletter for LIFE Carbon Farming.

The primary objective of this project is to develop a funding mechanism to support the implementation of low carbon projects on mixed crop-livestock farms. LIFE Carbon Farming is co-funded by the European Commission under the climate sub-programme within the 2020 call of the LIFE programme (LIFE20 CCM/FR/001663). In this issue we report on the first European seminar of the project in Brussels, we cover the establishment of a European carbon farming network in France, and finally we document the 2023 Teagasc national beef conference.

Teagasc National Beef Conference 2023

Teagasc Director, Professor Frank O'Mara delivering the opening address at the national beef conference in Co.Galway

The national beef conference returned to Ballinasloe, Co. Galway for a second year in a row on the 21st November 2023. The Shearwater Hotel was again the venue for this Teagasc event. The theme of the 2023 national beef conference was "Improving the green credentials of Irish beef production". Teagasc Director, Prof. Frank O'Mara, gave the opening address at the event. He stated that Irish beef producers operate extensive farms that already have excellent green credentials in terms of carbon footprint and nitrogen use. The Director briefly outlined the strategy and technologies to further improve the green performance of cattle farms in a cost effective manner. He noted the challenging weather and markets conditions faced by beef producers this year, but highlighted that cattle farms in Teagasc programmes have made significant progress in cutting emissions and increasing family farm income.

"Implementing sustainable technologies on beef farms" was the title of the first session of the conference. Session 2 focused on "Increasing our Competitive Advantage on the Global Stage". There were three presentations in each session, including one by the co-ordinator of LIFE carbon farming, Anaïs L'Hôte, about certification schemes paying French farmers for their carbon footprint reductions. Anaïs presented the schemes in the context of the Label Bas Carbone, the French certification framework for low carbon projects. She described the methodologies recognised by the framework, particularly the Carbon-Agri method, and showed how it has been applied on beef farms. Anaïs explained the Carbon-Agri method first undertakes an initial audit of the overall farm through life cycle analysis using the CAP'2ER tool. The results of the first audit give the baseline level of emissions and sequestration for a farm. After establishing the baseline, a

carbon action plan is built with CAP'2ER. In this step, the farmer and advisor choose the best mitigation actions from a list of 40 options according to Anaïs and forecast the amount of carbon avoided. Mitigation actions are typically applied over a 5-year period and assessed at the end of a project in a final carbon audit. The results of both audits are compared to quantify the amount of carbon avoided by a farm, which is then verified by an external auditor to receive the Label Bas Carbone certificates.

Anaïs explained that beef, dairy and tillage farmers are paid for Label Bas Carbone certificates through the French Carbon Agri association (FCAA). This company was founded by French breeder associations. It acts like a broker between the farmer, Ministry of Ecological Transition, and the companies buying carbon certificates. The FCAA draws up and manages contracts with farmers and the companies buying the tonnes of carbon avoided. Presently, each tonne of carbon is valued at €40, with €32 returned to the farmer, while €8 goes to an advisory company and the FCAA. The Label Bas Carbone certificates are used to reduce the GHG emissions of value chains i.e. insetting and are sold on the voluntary carbon market to offset residual emissions. Anaïs indicated they may become part of the mandatory markets as new French laws require airlines to offset all of their emissions from local flights in 2024 and oblige coal-fired power plants to offset emissions.

The French way of rewarding farmers for reducing or removing carbon was discussed by a panel of experts along with the potential to reduce emissions from Irish beef farm. Dr Siobhan Kavanagh described a number of the key emission reduction technologies currently available to Irish cattle farms. She showed that demo cattle farms in the Teagasc Signpost programme are leading the way in the adoption of these technologies such as lime and protected urea. The Signpost cattle farms doubled the use of protected urea in 2022, while decreasing fertiliser nitrogen use by an average of 15% relative to 2021 levels. The reduction in fertiliser nitrogen was primarily achieved through increasing average lime application from 28 to 41 ton per farm. Together these changes led to a 2.2% reduction in carbon emissions for the Signpost cattle farms, notwithstanding a slight increase in livestock numbers.

The Signpost cattle farms also performed well in terms of beef carbon footprint, averaging 8.5 kg CO_2 equivalent/kg of live weight produced. The carbon footprint of the Signpost farms was 10% below the average for Irish cattle farms. Siobhan highlighted the potential to further decrease the footprint and total emissions through optimising fertiliser nitrogen use, increasing the share of nitrogen spread as protected urea and via improving genetic merit. Breeders can now directly select for carbon efficient animals in the new beef indexes described by Dr Paul Crosson. Other technologies noted for lowering emissions included decreasing the delay in age at first calving, reducing beef finishing age and mixed swards. Ellen Fitzpatrick covered the steps to establishing mixed swards and outlined the benefits of offering them to dairy beef heifers in Johnstown Castle.

Dr. Siobhan Kavanagh finished her talk with the next steps for the Teagasc Signpost programme, which are to continue reducing emissions from the

demonstration cattle farms and to scale up the adoption of emission reduction technologies. The Signpost advisory programme has been put in place to support the realisation of the latter goal. It will provide an enhanced advisory service to farmers to assist them with the move towards more sustainable farming systems. This free service is supported by AgNav, the Sustainability Digital Platform that will allow farmers to see and understand their carbon emissions. A team or 21 Signpost climate advisors are now in place to support this programme.

Establishment of carbon farming network: 1st European meeting

The inaugural European network meeting of LIFE carbon farming took place in the northeast of France from the 6th to 8th of November 2023. Institut de l'Élevage (IDELE) setup the initial EU carbon farming network in conjunction with national partners, Seenorest, the French Carbon Agri Association (FCAA) and APAL, an Eastern animal production association. Teagasc researchers and future beef farmers attended the event and contributed to the rich exchanges between national and international partners.

IDELE kicked off the carbon farming network on the afternoon of the 6th with a conference at the Chamber of Commerce and Industry in Nancy. The conference brought project developers, farmers, advisors, aggregators and retailors up to speed on the status of LIFE carbon farming. Anaïs L'Hôte of IDELE introduced the project to the attendees of the conference, stating the objectives, partners, actions and expected outcomes. She outlined the tools deployed in LIFE carbon farming to undertake whole farm sustainability assessments and covered the method for measuring/monitoring, reporting and verifying emission reductions and removals on 700 livestock farms, 40 of which are in Ireland. This methodology, known as Carbon Agri, is widely used in carbon farming initiatives in France. It will be adapted for partner countries. Anaïs highlighted that the official French label, Label Bas Carbone (LBC), recognises the Carbon Agri method. The LBC is a certification framework for valuing projects attempting to reduce GHG emissions and/or increasing carbon sequestration in France. A number of carbon farming initiatives have received the LBC according to Anaïs and have been rewarded through this type of funding mechanism.

Testimonies were provided by stakeholders at the conference on rewarding mechanism for farmers and in regards to farm-level carbon accounting. Researchers at the University of Liege described carbon accounting for a cohort of dairy and beef farms participating in the project in Belgium. Francoise Lessire and Isabelle Dufrasne covered the methods for modelling GHG emissions and carbon sequestration and disseminated results from the first audit. The researchers applied the CAP'2ER tool to conduct this initial audit of livestock farms. This tool also quantified the baseline carbon footprints of agricultural products i.e. milk and beef live weight on a gross and net basis. Gross carbon footprint excluded carbon sequestration, whereas the net footprint included this process. The actions implemented on Belgian farms to mitigate emissions were described along with challenges in improving the carbon footprint of technically efficient farms.

The FCAA discussed their role as an aggregator in overcoming barriers to the adoption of emission reduction and removal practices. Thomas Fustier outlined the association's

partnership model for connecting the actors of carbon farming projects with purchasers of carbon certificates. He briefly described the certification requirements of the LBC and the major international standards i.e. VERRA, the Gold Standard and the United Nations Clean Development. Thomas presented the collective projects the FCAA have managed to date for the LBC and their value. He warned of financial and certification risks associated with carbon farming projects, but expects the association will be able to manage these risks. Thomas concluded on how the FCAA aim to support more livestock producers curb climate change by growing the number and value of carbon farming initiatives.

Project partners and stakeholders attend kick-off conference of European carbon faming network

The attendees of the conference heard of several new projects that are under development for reducing emissions from French livestock production. One project recently established in the Grant Est by APAL in conjunction with the supermarket, Lidl France was presented by Lucile Gérardin. This unique partnership involves 20 farms and 37 breeders who together plan to reduce GHG emissions by 16,000 t of CO_2 equivalent in 5 years. Lucile stated that Lidl will reward these farmers and breeders for their actions by purchasing their emission reductions and have formalised this agreement. She outlined how the carbon farming project fits within an insetting programme the supermarket is developing to mitigate its climate impact. Lidl have quantified that nearly all (99%) of the organisation's climate impact is due to carbon emissions coming from its suppliers i.e. scope 3 emissions. Livestock production is an important contributor to the organisation's scope 3 emissions, which Lidl is keen to decrease. This was highlighted in farm visits after the conference where beef and dairy farmers supplying the supermarket described the practices they have put in place to reduce emissions and increase carbon sequestration.

Puits Paramel farm located beside the village of Houdelmont was the first farm visited on day 2 of the network. Mathieu Peultier manages Puits Paramel farm with his family. He runs an extensive dairy system and has a tillage enterprise on the farm. Mathieu also finishes beef cattle at 25 months of age. The total size of his farm is about 99 ha. Currently, 70% of the farm is in temporary or permanent grassland and the rest is used to produce crops, particularly wheat for local bakeries. Mathieu calves his herd of 43 dairy cows in Autumn and turns them out to pasture in April. He operates a rotational grazing system where cows are move to new pastures every 48 hours. The swards on the farm are generally comprised of semi-natural species. Holstein Friesian and Friesian x Normande crossbreed cows are milked with a robotic system and on average produce 7,303 l/cow. The herd is rehoused in

early November and offered a mixed ration comprised of silage, hay, cereals, minerals and vitamins. Replacement heifers generally enter the milking herd at 30 months of age. Mathieu's plan is to reduce age at first calving to 24 months. This practice change is included in his carbon action plan along with 2 ha of new agroforestry planted on the farm. Over the course of the project, both actions are projected to save 102 tonnes of carbon emissions. Mathieu is also considering reducing the mortality rate of dairy calves to further decrease emissions by improving animal welfare.

The next farm the participants went to see was Ferme de Braquemont in the agricultural school of Mirecourt. Braquemont farm consist of 154 ha of grassland and a small area (8-9 ha) of arable land. The main soil type on the farm is a clay-textured soil. The manager of Ferme de Braquemont, Franck Sangouard, operates a mixed livestock system, comprised of dairy, beef, sheep, pig and poultry enterprises. The dairy unit is the main enterprise on the farm. It is a grass-based system with 90 cows on 137 ha of permanent and temporary grassland. The herd is comprised of robust crossbred dairy cows. Franck uses a 4-way cross between Simmental, Normande, Brown Swiss and Montbéliarde to breed durable cows. Normally, the herd produces about 4,500 l milk/cow per annum and averages 5 lactations per cow. Replacement heifers are reared on farm and calve at 35 months of age. One of the goals of the unit is to minimise costs by maximising milk production from grazed grass. Pasture makes up 50%-70% of the animal's diet and is rotationally grazed. The length of the grazing season is normally 7 months and usually begins in April. Pigs and poultry are reared outdoors as well along with a flock of 400 sheep and a small herd of Saler beef cattle. Salers are reared on farm and typically brought to a carcass weight of 430 kg. Finished cattle generally make around €5/kg CW, which is slightly above current production costs.

Rotational grazing of dairy cows in November on Braquemont farm in the north east of France

Almost 60% of the GHG emissions related to beef production in Mirecourt are offset by carbon storage. For dairy production, carbon storage offset 70% of the emissions from the enterprise. In total, Ferme de Braquemont stores about 401 t CO_2 equivalent. Franck plans to increase carbon storage by planting 5km of hedges and 8.3 ha of agroforestry. Additionally, he aims to increase efficiencies by improving genetic merit for milk production and optimising animal turnover rate. He is also investing in new machinery to decrease emissions from manure spreading in his carbon action plan and installing mats to improve animal welfare. Together these actions are projected to save 626 tonnes of emissions by the end of 2024 and will help bring the carbon footprint of the farm closer to net-zero.

The third farm the group visited was Eric Chardel's in Florémont. Eric operates a suckler calf to beef system on 138 ha and runs a tillage enterprise on 10 ha. He currently owns 74

suckler cows and typically carries 250 animals on the farm. The stocking rate for his beef enterprise is about 1 LU/ha. The majority of the enterprise (112 ha) is used to produce grass and lucerne for the herd. Suckler cows and calves are kept in loose housing on straw-bedding. The shed is fitted with adjustable creep gates for calves. Cows are bred to top limousine sires using artificial insemination. Male cattle are finished as bulls at 24-26 months of age on a forage-based diet. On average, they produce a carcass weight of 430 kg. Eric's supplies beef to Lidl. As a member of APAL, he has built a carbon action plan to support Lidl decrease scope 3 emissions. Eric plans to reduce the carbon footprint of beef production by accelerating the growth rate of breeding and finishing stock and by replacing maize with alfalfa, a lower input forage crop. He has also installed photovoltaic panels on rooftops and has planted new hedges to sequester carbon. Eric's carbon plan is expected to generate 528 tonnes of emission savings and potentially will be sold to Lidl at a price of €40/tonne.

The network wrapped up on the morning of day 3 with a visit to a beef farm on the outskirts of Metz. The manager of the farm, Jean-Marc Schmitt, runs a specialised beef finishing system on 109 ha and grows 38 ha of cash crops. Generally, he finishes 600 young bulls per year. He purchases heavy weanlings, greater than 400 kg live weight at 7 or 8 months of age and sells them to a meat processor once they hit a target carcass weight of about 475 kg. Young bulls are confined in open sheds and offered a total mixed ration by an automatic Lely vector feeder. This machine grabs and mixes feed for beef cattle and brings it straight to the face of the feeding barrier. It formulates specific rations for the different categories of animals on the farms e.g., growing and finishing cattle. The ration generally consists of maize, rapeseed meal, cereals and forages. Rapeseed meal is included in the diet instead of soya to cut emissions and is one of the actions in Jean-Marc's carbon plan. He has implemented several carbon actions, such as cover cropping, direct seeding, precision nutrition and installed ventilation fans to improve animal comfort. In total, he has invested about €250,000 in these actions, which are projected to generate 3,295 tonnes of emission reductions. The results of Jean-Marc actions in terms of carbon emissions will be known in the final year of the project and presented to stakeholders.

Robotic Lely feeder delivering a mixed ration to Charolais bulls on the farm of Jean-Marc Schmitt

Carbon Farming Certification – Brussels Seminar

Jean Baptiste Dollé, Head of Environment, IDELE, presenting lessons learned from past carbon farming initiatives at the first EU project seminar

Project partners, government agencies, and industry stakeholders along with policy representatives of the European Commission gathered on the 25th January 2023 in the University Foundation, Brussels to discuss carbon farming and carbon removal certification. The Brussels seminar was organised and chaired by IDELE with input from project partners. In the first session of the event, the European Commission provided the policy context for carbon farming and the newly proposed carbon removal certification framework (CRCF). The commission's representative, Valeria Forlin, presented the EU's climate law and targets. She showed that large reductions in GHG emissions, up to 90%, along with a 2-fold increase in carbon removals are required to realise the EU's vision of climate neutrality by 2050. Carbon removals need to start rising rapidly after 2030 to balance hard to abate GHG emission from sectors like agriculture. This will in part be achieved through the development of a voluntary EU framework for verifying high quality carbon removals. Valeria described the proposed framework and the different types of carbon removal activities considered. Carbon farming is one type of carbon removal activity, which will be assessed according to the QUALITY criteria:

1. Quantification
2. Additionality
3. Long-term storage
4. Sustainability.

Third parties will use these criteria to certify carbon removals according to tailored methodologies in the CRCF. Implementing the CRCF is expected to improve public confidence in carbon removals, counter greenwashing and encourage farmers adopt effective carbon removal solutions.

Various projects have identified carbon removal and emission reduction solutions for livestock farms. Jean Baptiste Dolle, IDELE provided a synopsis of the lessons learned in past projects. He indicated where there is capacity to cost effectively reduce emissions, plus advised to appraise carbon farming solutions with a multi-criteria approach. However, this approach is difficult and costly to apply on farm. Producers require support in doing multi-criteria sustainability assessments according to Jean Baptiste, and need training implementing carbon solutions. Finance is also need to put solutions in place and to scale up carbon farming. Jean Baptiste outlined how it could be provided through a result-based funding mechanism. This type of mechanism is created through a partnership model, which he believes has been crucial to the success of French carbon farming projects.

Progress in developing a results-based funding mechanism at an EU level in LIFE carbon farming was shared by Anaïs L'Hôte, IDELE and project partners. This was followed by a presentation on the Label Bas Carbone by the French Ministry of Energy Transition and testimonies on the implementation of low-carbon agricultural projects. After the testimonies and presentation, there were workshops regarding certification of carbon farming practices and carbon funding mechanisms. Both workshops were co-chaired by IDELE and the Institute for Climate Economics (I4CE). Project participants and stakeholders discussed measuring /monitoring, reporting and verification processes to certify emission reductions and removals, and covered funding models, the voluntary carbon market, double counting, and other aspects of carbon farming. The participants responses were synthesised and shared. Initial conclusions were drawn at the end of the seminar and are likely to feed into the design of processes and mechanisms in LIFE carbon farming.

See you in the next issue

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