

Peer learning session

Carbon farming on a Grain Farm in Normandy

SESSION CONTEXT

The Peer learning session of the Smart Carbon Farming Project was held the October 23th of 2024 in The Farm "EARL des Petits Ifs" in Burey, Normandy.

The session, organised by [Ver de Terre Production](#) brought together farming organisations, advisors, scientifics and project partners from the Smart Carbon Farming (SCF) consortium to observe how Soil Conservation Agriculture (SCA) can be successfully integrated into a high-performance commercial framework.

OVERVIEW OF THE FARM ACTIVITY AND INNOVATIVE MODEL

VISION & OBJECTIVES

The transition at EARL des Petits Ifs was guided by two pillars designed to ensure long-term sustainability. First the profitability by targeting a minimum gross margin of €1,000/ha to remain competitive, proving that environmental stewardship and profitability are not mutually exclusive. At the same time the focus was put on restoring organic matter from initial levels of 1.2–1.5% to levels that ensure long-term soil fertility and structural resilience (2–2.5%).

FARM STRUCTURE

Since 2012, the farm reflects a high-complexity operation focused on value-added outputs across a total cultivated area of 250 hectares. Supported by a labor force of 4 Annual Work Units, the farm manages a challenging clay loam soil featuring a 5–6% clay content that makes it naturally compact. Through the implementation of soil conservation practices, they have driven a substantial organic matter evolution, increasing the soil's OM level from 1.3% at installation to a current average of 2.5%. This enhanced soil structure supports a diverse current crop rotation which includes wheat, barley, rapeseed, fiber flax, and grain corn.

METHODOLOGY

The Farm and the carbon farming program of which it is a part distinguishes between practice-based modeling and physical soil analysis. At EARL des Petits Ifs, the Resoil/Veolia model utilizes satellite remote sensing to monitor compliance with regenerative practices, providing a cost-effective method for scaling.



- 1 Liquid nitrogen is fractionated into 4 to 5 targeted applications



- 2 Rotation: Wheat, Barley, Rapeseed, Fiber Flax, and Grain Corn, breaking weed and disease cycles



- 3 No till system



- 4 Annual application of 10 t/ha of self-produced green waste compost



- 5 Crop Protection & Covers: 365-day continuous soil cover

FINANCIAL MODEL

Beyond environmental metrics, the farm's success is grounded in hard economic reality, reporting a total turnover of €907,108 and a net revenue of €187,000.

The voluntary carbon market provides a significant secondary income stream. With carbon valued at €37.5 per tonne, the farm's certified storage of 305 tonnes per year generates approximately €11,437.50 in annual revenue, incentivizing the continued adoption of high-sequestration practices.

IMPACT & CHALLENGES

Severe Weed Pressure and the Herbicide-Resistance: The farm faces aggressive, systemic pressure from grass weeds, specifically ryegrass and foxtail, which have grown increasingly resistant to standard chemical herbicides.

Neighborhood Skepticism: Breaking away from conventional farming paradigms often isolates pioneers within their local communities.

Asymmetry in Corporate Negotiations: The transition highlights a structural risk where individual farmers negotiate complex multi-year contracts on the voluntary carbon market with massive multinational corporations.

FARMER SPOTLIGHT: KEY INSIGHTS & HIGHLIGHTS OF THE FARM "LES PETITS IF"



Motivations beyond financial gain:

- The farm's transition is fundamentally anchored in the concept of "soil legacy"—a deep commitment to preserving and regenerating the land's fertility to transmit a robust, high-performing farm to future generations.
- Operational efficiency and time-saving were critical drivers. The transition has significantly streamlined farm organization and minimized labor requirements while eliminating surface crusting, a severe structural vulnerability typical of the naturally compact, loamy soils of the region.



Successful carbon farming practices implemented:

- **No-Till & Direct Seeding:** Transition to direct sowing in 2018 eliminating plowing to protect soil structure.
- **Continuous Soil Cover:** Planting multi-species cover crops to prevent erosion and nitrogen leakage
- **Diversified Rotation:** Utilizing a rotation of wheat, barley, rapeseed, fiber flax, and grain corn to disrupt weed and disease cycles and promote underground biological resilience.
- **Organic Amendments:** Applying 10 t/ha of compost to stimulate soil biology, alongside paper mill boiler ash every 5–6 years to correct pH from 5.8 to 6.5.
- **Precision Nitrogen Management:** Fractionating liquid nitrogen into 4 to 5 highly targeted applications and using the N-Tester leaf-clip tool to adjust doses in real time, preventing nitrate leaching.



Tangible benefits for farmers:

- **Load-Bearing Capacity:** The restored, well-structured soil has dramatically improved load-bearing capacity. Even during highly wet periods, they can easily drive an heavy machinery across fields without causing compaction, deep ruts, or getting stuck—allowing for precise fertilizing
- **Energy and Fuel Efficiency:** By entirely suppressing plowing and heavy tillage, the farm's fuel consumption has plummeted to **60 L/ha**. This represents a **40% reduction** in fuel overhead compared to the French national average of 100 L/ha.
- **Biological Auto-fertility:** The elimination of tillage has sparked massive **earthworm activity**. This biological life naturally aerates the soil, accelerates residue decomposition, and drives stable organic matter accumulation



Innovations :

- **Sowing Date Trials:** Delayed sowing of wheat (Nov 30) to bypass weed pressure yielded 11 t/ha compared to only 5–6 t/ha for October-sown wheat in the same block.
- **Experimental drone-seeding:** Seeding cover crops directly into standing cash crops before harvest to capture residual soil moisture and cut establishment costs.

KEY TAKEAWAYS FOR OTHER CARBON FARMING PROJECTS & ADVISORS



Prioritize Agronomic Flexibility

Carbon farming should be managed as a goal, not a constraint. Advisors must encourage farmers to use tools like shallow tillage when weed resistance or soil conditions threaten the economic viability of the farm. Yield security is the foundation of long-term environmental sustainability.



The "365-Day Cover" Rule

Continuous soil cover is the engine of sequestration. By utilizing diverse species and innovative seeding methods (like drone-seeding or broadcasting before harvest), farmers maximize biomass and root exudates, which represent up to 30% of total plant biomass.



Help managing the pioneer dilemma

The transition can be socially taxing; the farmer noted the challenge of being viewed as an "alien" by neighbors. Advisors should emphasize the importance of technical discussion groups to provide a supportive network and mitigate the social pressure



The Research & Innovation Mentality

Success in carbon farming requires a culture of continuous testing. A "research-first" approach is vital for optimizing inputs and maximizing margins. The Farm confirms that when carbon farming is treated as a strategic business decision, it creates a self-reinforcing cycle of biological health, operational resilience, and significant economic profitability.



Mitigate Power Asymmetry in Carbon Contracting

Individual contracts can be signed without independent legal, agronomic, or financial counsel to protect the farm's interests. Because these voluntary markets rely heavily on practice-based modeling rather than actual physical soil measurements, and can involve the application of industrial by-products like boiler ash, advisors must help farmers establish clear input liability protections, audit chemical safety analyses, and secure guaranteed floor pricing to insulate them from market volatility



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