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Italian Vineyards Turn to Carbon Farming as EU Project Seeks to Certify Climate-Friendly Wine Production

LIFE VitiCaSe initiative introduces digital tools and carbon credits, aiming to boost sustainability and revenue for European winegrowers

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In the rolling hills of Tuscany and other Italian wine regions, vineyards are taking on a new role in the fight against climate change. For the past two years, the LIFE VitiCaSe project has been working to transform how grape growers manage their land, focusing on carbon farming practices that help capture and store carbon in vineyard soils.

LIFE VitiCaSe, which stands for Viticulture for Soil Organic Carbon Sequestration, is co-financed by the European Union through the LIFE program. The project brings together a network of companies, research centers, and local wine producers. Image Line®, an Italian agri-tech company, leads the initiative alongside partners such as EZ Lab France, Carbon Credits Consulting, and several well-known wineries including Castello di Albola, San Felice Wine Estates, and Tenute Ruffino. Research support comes from CREA (Council for Agricultural Research and Economics), with additional input from the Siena Provincial Farmers' Union and consulting firm Euris Srl.

The project's main goals are to increase organic carbon stocks in vineyard soils, reduce greenhouse gas emissions through sustainable management and digital innovation, and contribute to climate change mitigation. Unlike other carbon farming efforts, LIFE VitiCaSe uses an integrated approach that covers every step: from studying sustainable soil management techniques to measuring their impact with digital tools and generating certified carbon credits for sale on voluntary markets.

Over the summer of 2025, technical teams visited pilot vineyards to monitor how these new practices were being implemented. These site visits allowed researchers and company technicians to assess both environmental and economic impacts directly in the field. They discussed challenges such as unpredictable weather patterns, limited access to technical equipment, high costs for organic fertilizers like manure, and the need to adjust schedules around each winery's operations.

Continuous monitoring has proven essential. By recording choices, results, and difficulties in real time, the project builds a shared knowledge base that can help other vineyards replicate successful strategies. According to Matteo Munaro, Smart Farming Specialist at Image Line®, these field inspections are crucial for validating the sustainability and effectiveness of experimental practices. They also provide feedback that helps refine both business models and impact assessments.

A key innovation from LIFE VitiCaSe is its digital Carbon Farming Tool. Developed by Image Line®, this software estimates how much organic carbon is stored in vineyard soils using internationally recognized models like RothC. The tool allows users to input or import their own farm data—such as climate conditions, soil characteristics, and management practices—and receive a guided estimate of their carbon balance. This information is vital for evaluating regenerative agriculture methods and preparing for carbon credit certification.

Certification is another central pillar of the project. Carbon Credits Consulting has started procedures to certify credits generated by carbon sequestration in pilot vineyards. After reviewing international standards, the team chose to work with the International Carbon Registry (ICR), an Iceland-based organization accredited by the International Carbon Reduction and Offset Alliance (ICROA). The process involves collecting detailed documentation from each winery about their production context and farming commitments. An independent third party will validate this information before credits are issued for trading on voluntary markets.

However, Gabriele Mongardi of Image Line® notes that complex certification requirements can be a barrier for many small Italian farms. This insight is being shared with policymakers as Europe develops its regulatory framework for carbon farming.

The project has also produced a white paper on sustainable vineyard practices—presented at Vinitaly 2024—and organized events like its first Demo Day to foster dialogue among partners.

LIFE VitiCaSe aims not only to demonstrate effective climate action but also to create a viable business model for wine producers. By certifying environmental commitments through carbon credits, vineyards could gain new revenue streams while supporting long-term soil health and sustainability.

Simona Palermo, Project Coordinator for LIFE VitiCaSe, says that next steps include improving the digital tool’s integration with farm management systems, completing credit certification procedures, launching credits on trading platforms, and expanding the model to more wineries in Italy and France.

As European viticulture faces increasing pressure from climate change, projects like LIFE VitiCaSe offer a path forward—one where environmental stewardship goes hand-in-hand with economic opportunity for winegrowers across the continent.