Edition #5

August 2026

>>> NEWSLETTER <<<

SAFEWAX NEWS

Sustainable Crop Protection Inspired By Nature

Ongoing open-field and greenhouse trials on grapevines Nimes, France (IFV)

SafeWax is entering a new phase of development with **innovative solvent-free and water-based formulations.** These approaches are designed to reduce reliance on organic solvents while improving the sustainability, safety, and practical applicability of the coating technology. The advances are also expected to support the generation of new intellectual property assets, further strengthening the SafeWax IP portfolio and exploitation potential.

SAFEWAX IN THE FIELD

A bio-inspired coating technology moves toward real-world crop protection

SafeWax is developing a new way to protect plants: not by relying primarily on toxic pesticide activity, but by redesigning the plant interface.

Inspired by naturally water-repellent leaves, SafeWax is a biodegradable coating that forms a thin protective layer on leaves and other aerial plant tissues. This superhydrophobic layer changes how water droplets, environmental particles, and fungal spores interact with the plant. By making the surface less favorable for pathogen attachment and disease development, SafeWax offers a offers a bio-inspired, physical barrier-based approach for crop protection.

This concept is now moving from controlled experiments into real agricultural environments. That transition is critical. A coating that performs well in the laboratory must also function under real-world agricultural conditions, including exposure to sunlight, heat, irrigation, changing weather, natural disease pressure, and the biological complexity of different crops.

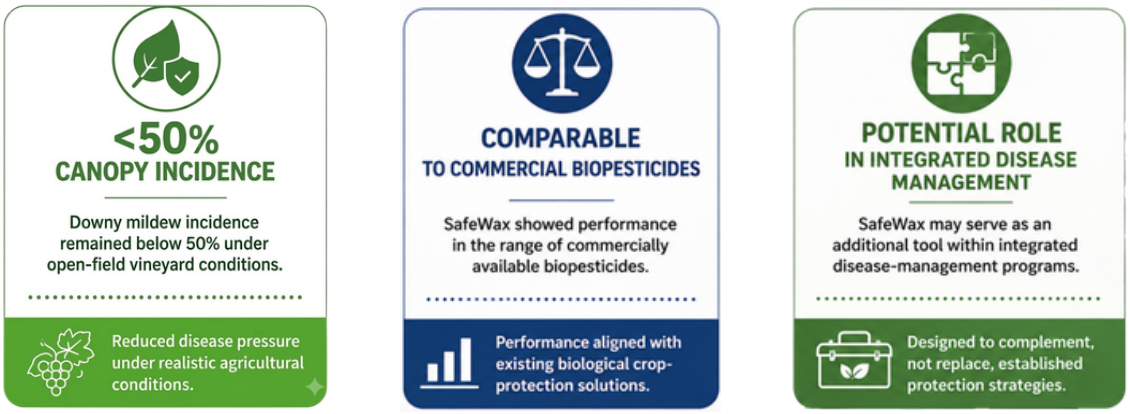
Edition #5 follows SafeWax into its next stage: field validation. The latest work includes encouraging results from open-field grapevine trials in Bologna, expanded testing on wheat and tomato, and ongoing vineyard studies in France and Italy.

Together, these activities mark an important step toward validating SafeWax as a sustainable plant-compatible crop-protection technology.

ENCOURAGING RESULTS FROM OPEN-FIELD GRAPEVINE TRIALS

The 2025 open-field vineyard trials in Bologna provided one of the most important tests of SafeWax to date.

Under realistic agricultural conditions, SafeWax showed an intermediate level of control against downy mildew, with canopy incidence remaining below 50%. This level of performance was comparable to that of commercially available biopesticides, supporting the potential of SafeWax as an additional tool within integrated crop-protection programs.



This represents a strong and realistic positioning. SafeWax is not being developed as a direct one-to-one replacement for conventional fungicides. Rather, its value lies in a distinct mode of protection based on the formation of a bio-inspired superhydrophobic coating with a physical mode of action, helping to reduce pathogen establishment while complementing existing disease-management strategies.

For growers, this type of approach could become especially valuable in crop-production systems where reduced chemical inputs, biological products, and precision application programs are increasingly important.

Bologna experimental open-field vineyard site, 2025, 2026.

SafeWax was evaluated under realistic growing conditions and natural disease pressure.

Why downy mildew matters

Downy mildew is one of the major diseases affecting grapevine production. It can damage leaves, shoots, and fruit, reducing yield and quality. Disease control often requires repeated treatments, particularly under humid conditions. SafeWax introduces a different protection logic: instead of acting primarily as a toxic agent against the pathogen, it modifies the plant surface to make pathogen attachment and disease development less favorable.

OPEN-FIELD AND GREENHOUSE STUDIES IN FRANCE AND ITALY

Protecting the Plant Surface While Preserving Plant Function

A major challenge for any foliar coating is achieving the right balance. The coating must provide protection, without interfering with the plant's essential biological functions.

Leaves are active tissues. They exchange gases, regulate water loss, absorb light, and respond continuously to environmental stress. A successful protective coating must therefore act at the surface without disrupting photosynthesis, transpiration, or stomatal conductance.

The Bologna field results are encouraging. SafeWax did not interfere with key gas-exchange parameters, including transpiration, photosynthesis, and stomatal conductance. Treated plants also maintained lower leaf temperatures. These findings go beyond disease control and support the broader SafeWax concept: a multifunctional coating that can contribute to disease management while maintaining plant physiological performance and increasing crop resilience to rising temperatures and other climate-related stresses.

The 2026 trial season further expands grapevine testing across multiple sites. Ongoing studies are being conducted in Nimes, southern France, together with additional open-field and greenhouse trials in Bologna, Italy. These complementary locations allow SafeWax to be evaluated under different environmental conditions, cultivation practices, and levels of disease pressure.

Left: Open-Field Trials | Right: Greenhouse Trials. Nimes, France

The vineyard trials also showed no significant differences in grape quality attributes during ripening. This is important, as a crop protection technology has practical value only if it remains fully compatible with normal crop development, harvest, and final product quality.

At the same time, SafeWax is now addressing the practical questions required for real-world implementation use. Microvinification trials are ongoing in 2026, while the management of wax residues remains an important challenge under investigation. This is part of the normal transition from promising technology to field-ready application: performance must be matched with processing compatibility, product quality, and grower acceptance.

Key field message: SafeWax contributed to downy mildew control while preserving measured gas-exchange parameters. The next step is to optimize the application protocol and wax residue management for practical agricultural use.

EXPANDING SAFEWAX ACROSS CROPS, PATHOGENS, AND ENVIRONMENTS

SafeWax began with a strong focus on grapevine protection, but the larger opportunity is broader: can a bio-inspired coating strategy be adapted to different crops and major plant diseases?

The current research program is now expanding to include durum wheat and tomato.

In wheat, ongoing open-field experiments are evaluating include efficacy and safety against Fusarium head blight.

Open-Field Wheat Trials

In tomato, greenhouse trials are focused on late blight, caused by Phytophthora infestans.

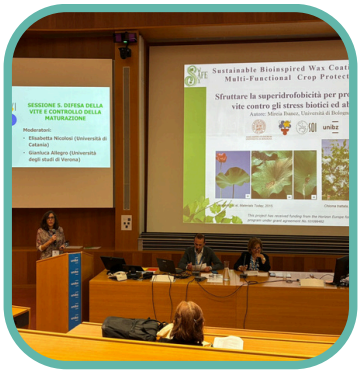
Greenhouse Tomato Trials. Left: Control (Uncoated) | Right: Treated (Coated). Bologna, Italy

This expansion is scientifically important because each crop presents a different biological interface. Grapevine leaves, wheat heads, and tomato foliage differ in surface architecture, chemistry, growth dynamics, and patterns of pathogen exposure. Likewise each pathogen is also characterized by a specific infection biology and favorable environmental conditions for disease progression.

By testing SafeWax across these diverse systems, the consortium is building the knowledge required to identify the conditions under which the coating is most effective, how the formulation should be optimized, and which crop-pathogen systems offer the strongest routes toward application.

SAFEWAX TAKES THE SCIENTIFIC STAGE

SafeWax continues to its visibility across the scientific community, with recent presentations at key conferences and meetings focused on viticulture, nanotechnology, microscopy, and sustainable agriculture. These events provided valuable opportunities to share the project's latest progress, discuss field-validation results, and receive feedback from researchers and stakeholders working at the interface of materials science and crop protection.



Mireia Ibanez Revert, PhD Student, Bologna University
11th National Conference on Viticulture
CONAVI 2026

Prof. Boaz Pokroy
59th Annual Meeting of the Israel Society for Microscopy
ISM 2026

Niv Ben-Arie, PhD Student, Technion
Gordon Research Conference on Nanoscale Science and Engineering for Agriculture and Food Systems
GRC 2026

Building Momentum for Sustainable Crop Protection

Together, these presentations highlight the growing scientific interest in SafeWax as a bio-inspired, surface-based approach for crop protection. By engaging with communities in plant science, viticulture, microscopy, nanotechnology, and agricultural innovation, the project is strengthening the scientific foundation needed to move from field validation toward practical application.

At this stage, the focus is clear: generating robust evidence, refining the coating for real-world agricultural use, and identifying the crop-pathogen systems where SafeWax can deliver the greatest value.

FOLLOW SAFEWAX FOR UPDATES FROM THE 2026 TRIAL SEASON.

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