



Bio Crimson program



Farmer's name

Spiros Karachalios



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Name of the farm

Velina Karachalios vineyard



Country

Velina, Kiato, Greece



Description of the farm context

The farm, located in Velina in the Korinthos region at relatively high altitude, extends over approximately 2 hectares and is cultivated with a vineyard of Crimson Seedless table grapes. The soil is predominantly acidic (pH 5.5) with some calcium deficiency and is characterized by its red coloration. Climatic conditions are generally dry, though the vineyard is periodically affected by sporadic extreme weather events such as hailstorms and sudden drops in temperature. In addition, the farmer faces challenges from Esca infections.

Partner Organization



AdvisoryNetPEST

The **AdvisoryNetPEST** project aims to create a **network** and **upgrade advisory services** across the EU to increase the sharing of knowledge and the **adoption of innovative solutions to reduce the use and risks of pesticides** (RURP) in all **EU Member States**, enabling the agricultural sector to achieve the targets proposed by the Farm to Fork Strategy.



[AdvisoryNetPEST](#)



www.advisorynetpest.eu

The practices identified in this project are called 'Novel Approaches' and abbreviated as 'NA'

THE TECHNIQUE

Short Description:

Development of a modern, personalized vine protection program based on biostimulants

Crop Sector:

Viticulture

Targeted pest and diseases:

Wide range of pest and diseases

Objective of the NA:

This initiative aims to reduce input costs by employing innovative metabolomics methodology. It is expected to decrease production losses and the use of plant protection products, thereby supporting the improvement of quality and sustainability in grape cultivation. The study of the metabolic composition of vines, aimed at discovering the optimal timing and dosage of selected biostimulants under specific soil and climatic conditions, represents an innovation and a new approach to plant protection.

Level of practice adoption across the country:

1 2 3 4



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Expectations regarding RURP

The use of biostimulants in the Crimson vineyard is expected to reduce reliance on chemical plant protection products by strengthening the vines' own defense mechanisms and improving resilience to abiotic stresses such as drought and high temperatures. By enhancing vine vigor, regulating metabolism, and supporting better nutrient uptake, biostimulants contribute to healthier plants that require fewer chemical interventions.



Methods/strategy of application in the farm

The farmer applied three types of biostimulants, laminarin, humic and fulvic acids, and seaweed extract, exclusively through foliar applications. Treatments were carried out at three distinct phenological stages, coordinated with the responsible agronomist. A general protocol provided the basic framework, but the timing and dosage were adapted to local conditions, seasonal variability, and weather challenges. This ensured that applications were tailored to the vineyard's specific needs while maintaining consistency with the overall programme strategy.



Figure 1: Crimson grape vineyard



Key success factors

The key factors for successful adoption were close collaboration with agronomist, who adapts protocols to vineyard conditions and climatic challenges, and access to the necessary biostimulant formulations (laminarin, humic and fulvic acids, Ascophyllum nodosum seaweed extract). A clear application strategy, with foliar treatments at three phenological stages, ensured proper timing and dosage. Success was further reinforced by the farmer's acceptance and commitment,



Improvements of the NA

No major modifications to the practice are needed. However, improvements focus on the continuous adaptation of application protocols to yearly climatic conditions in order to maintain consistency and effectiveness. As well as continuous experiments and scientific backing up on a farm level.



Figure 2: Crimson grape



Figure 3: Snaps from the field



Resources and skills needed to adopt the NA

Adopting the novel approach requires access to the specific biostimulant formulations used in the programme (laminarin, humic and fulvic acids, and seaweed extract). Applications follow established protocols, but these must be adapted to local vineyard conditions, climatic variability, and seasonal challenges in close collaboration with agronomists. Labour requirements are minimal, depending largely on vineyard size. In the cross-visit farm, applications were carried out by the farmer with the support of one additional person. No structural modifications to the cropping system were needed



Figure 4: Snaps from the field



Advice from the Advisor

Advisors welcomed the scientific validation positively and emphasized the need for its continuous confirmation through systematic farm-level trials, as broader evidence under real farming conditions is essential. They also highlighted the importance of awareness campaigns to inform producers about the benefits of biostimulants and encourage uptake. Together, these measures would confirm the cost-effectiveness and adaptability of the practice, supporting its wider adoption.



Policies and Regulatory Support

The adoption of biostimulants is indirectly supported by the policy framework for pesticide reduction, which promotes sustainable alternatives. No direct regulations exist. However programmes like RDP 2014–2020 (EAFRD, Sub-measures 16.1–16.2) that provided full funding for the BIO-CRIMSON project, offer essential support for wider implementation.



Farmers Testimony

The farmer reported clear improvements in vine resilience, berry color, fruit size, and overall quality, which increased the commercial value of the grapes. He noted that he support the use of biostimulants.



Social and Cultural Acceptance

The practice is compatible with local viticultural traditions and was well accepted by the host farmer, who intends to continue its use due to clear benefits in vine vigor, fruit quality, and market value. Advisors also confirmed this compatibility, while stressing that awareness campaigns and farm-level trials are needed to further strengthen adoption.



BENEFITS

The use of biostimulants improved vine vigor and resilience, while also enhancing fruit quality through greater uniformity, improved berry size and color, and reduced cracking. Overall, their use contributed to maintaining more stable production even under drought and heat stress conditions. Economically, the improvements in quality led to higher market value and better selling prices.



BOUNDARIES

No boundaries were reported, but adoption is limited by the need to adapt applications to vineyard and climatic conditions, as well as by water scarcity and economic constraints. Wider uptake also depends on farm-level validation and awareness campaigns to strengthen farmer confidence.

To go further on NA replication:

For wider replication of the NA, some conditions are necessary. Farmers need reliable market access to the specific biostimulant formulations and advisory support to adapt protocols to local vineyard and climatic conditions. Replication would also be reinforced by awareness campaigns and continuous farm-level trials, which provide the scientific validation needed to build farmer confidence.

Systemic Feasibility Analysis: Expert insights from Literature and Field Data

CITERIUM	INDICATOR	INDICATOR SCORE	EVALUATION
Pesticide use reduction level	Reduction of the applied volume of pesticides	high reduction (>25%) moderate reduction (10-25%) low reduction (<10%) no reduction	😊
Effectiveness of controlling the target pest/diseases/weed	Percentage reduction of the target pest/weed infestation or of the damage caused by the target disease	high reduction (>60%) moderate reduction (30-60%) low reduction (<30%) no reduction	😐
Soil quality	Impact on soil infiltration	--/-/0/+ / ++	😊
	Impact on soil organic matter	-/-/0/+ / ++	😊
Water quality	Impact on pesticide losses to surface water (runoff)	--/-/0/+ / ++	😊
Water conservation	Impact on water dependence	--/-/0/+ / ++	😊
Working conditions	Knowledge requirements	high training level moderate training level low training level no training	😐
Costs	Required level of investment	> EUR 100.000 EUR 50.000 - 100.000 EUR 10.000 - 50.000 < EUR 10.000	😊
	Impact on various types of variable costs: fuel, energy, labour, water, consumables...	Cost of the product	😐
Outputs	Impact on yields (produced volumes)	--/-/0/+ / ++	😊
	Impact on crop quality	--/-/0/+ / ++	😊
Profitability	Impact on profit margin	+	😊

Impact Highlights

The Bio Crimson Program represents a novel, metabolomics-based approach to vine protection, focusing on the personalized use of biostimulants to optimize timing and dosage under specific conditions.

Compared to the classical treatment plan without biostimulants, this method moderately reduces pesticide use and supports improved soil health, water efficiency, and nutrient retention, without requiring equipment investment.

Despite positive effects on crop quality, yield, and profit margins, pest and disease control remains variable and relatively limited (<30%). The primary disadvantages are the high cost of biostimulants and the significant knowledge demands.

Evaluation:


Not Satisfying


Not Satisfying


Moderately Satisfying


Satisfying


Very Satisfying