

**STIM
+
BLUE**

2025

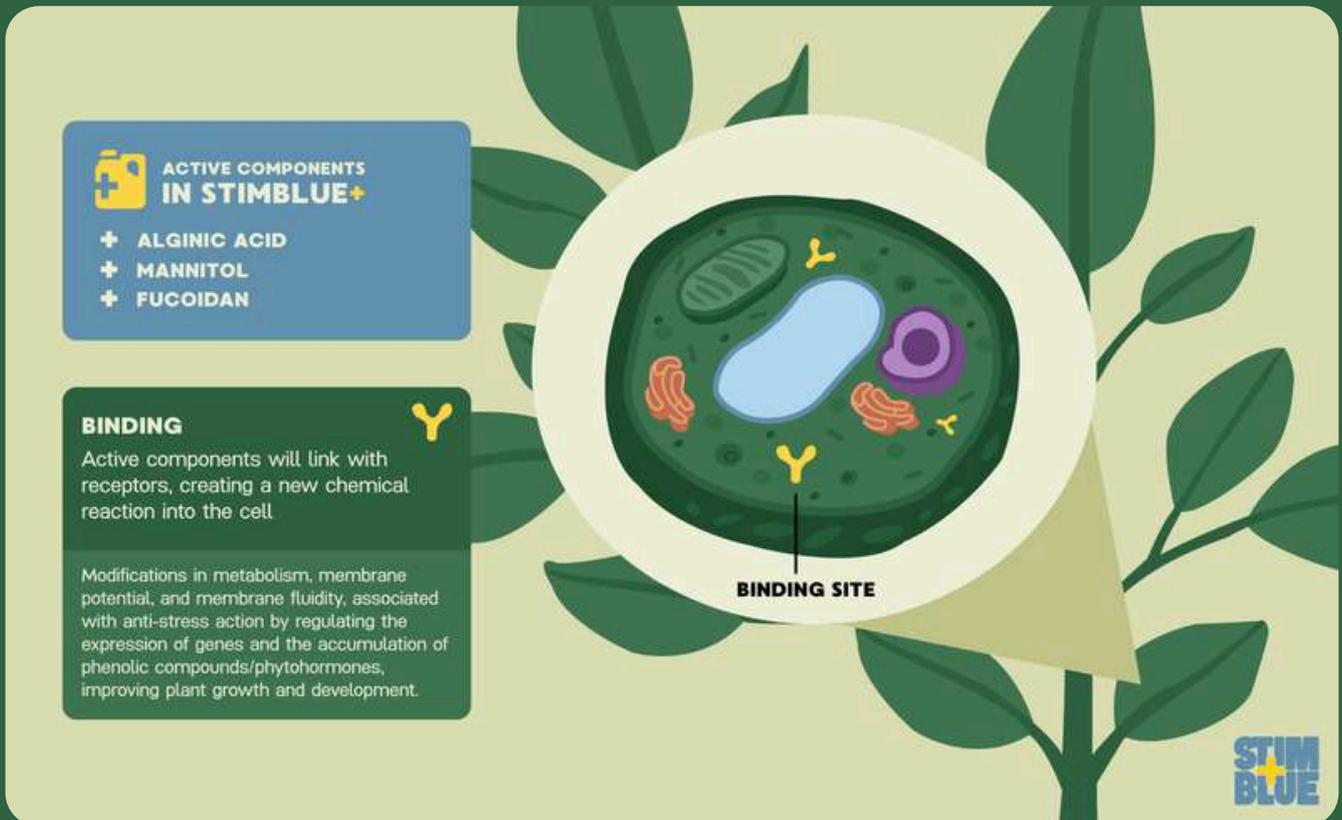
**BOOSTING
GRAPE
PERFORMANCE WITH
STIMBLUE+**

EUROPE, USA, & SOUTHERN AFRICA

STIMBLUE+

StimBlue+ is a biostimulant made from 100% cultivated Giant Kelp (*Macrocystis pyrifera*).

Giant Kelp is known for its possession of high quantities of compounds with bioactive properties, fast growth, and CO₂ absorption and retention capacity.¹ Seaweed and its extracts are valuable sustainable inputs in agriculture farming, promoting seed germination, plant growth, root development, and stress tolerance in plants.²



StimBlue+ suitable for use in Organic Agriculture conforming to the annexes of the European regulation (EU) 2018/848, (EU) 2021/1165 and American Regulation NOP (National Organic Program).

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**Pest management / fertiliser reduction*

GRAPE CULTIVATION

In 2024, global grape production spanned across 7.1 million hectares, yielding 72 million tonnes³ at an average of 10.8 t/ha.⁴ China leads global production of grapes at 19%, followed by Italy (9%), France (7%), the United States (mainly California) and Spain (7%).⁴ Grapes are often categorised as either table (fresh) grapes or wine grapes. In 2023, table grapes represented roughly 35% of total grape production, with the remainder being wine grapes, plus a small share for dried grapes/raisins and industrial uses.³

Grapes require a distinct growing season with warm days and (often) cool nights. Therefore, grapevines are mainly grown in regions with semi-arid and Mediterranean climates.⁵ Well-drained soils, moderate soil fertility, and deep soils (>1 m) are preferred, and grapevines do well on a variety of soil types. Vines need a warm, frost-free growing season for ripening, and extreme heat during veraison/harvest or spring frost can damage yields or quality.⁵

Climate change is causing for significant shifts in the industry, with studies showing that around 90% of coastal and low-altitude regions in southern Europe and California may no longer be able produce premium wine in economically sustainable conditions by the end of the century if global warming exceeds +2°C.⁶

STIMBLUE+ ON GRAPES

Across various trials on grapes, StimBlue+ has shown to boost the quantity and quality of grapes at harvest and even improve the soil microbiome, which plays a critical role in optimising crop yields, nutrition and stress resilience. Continue reading to learn how StimBlue+ can support grape cultivation across various locations.



FIELD TRIAL SUMMARY

As of 2025, 16 trials have been conducted to assess the effectiveness of StimBlue+ on grapes across 5 countries, with 15+ trials upcoming. Trials assess StimBlue+ compared to standard cultivation practices (control) and to leading seaweed-based biostimulant competitors. A special trial with BiomeMakers assessed the soil microbiome of crops treated with StimBlue+ in California (USA) and France.

COUNTRY	TOTAL VINEYARD AREA IN HA (2024)
SPAIN	930,000
FRANCE	783,000
ITALY	728,000
USA	385,000
SOUTH AFRICA	120,000



Harvest results across four treatments: control, StimBlue+ at 2 L/ha, StimBlue+ at 1L/ha, and competitor at 2 L/ha. Trial conducted by Champagne Expérimentation (2024) in France.

HIGHER YIELD, MORE \$

COUNTRY	YIELD*	ECONOMIC RETURNS/HA*
SPAIN	+27%	+\$8,500
FRANCE	+31%	+\$4,600
SOUTH AFRICA	+27%	+\$6,040
USA	+5%	+\$845



*Yield: Average % yield increase per hectare across all trials at a dosage of 2 L/ha.

*Economic returns/ha: Average increase in economic returns per hectare in USD across all trials at a dosage of 2 L/ha.

SUGGESTED APPLICATION

For optimal results: apply 3 applications of StimBlue+ at 2 L/ha.

+ FIRST APPLICATION

Apply as a foliar spray at BBCH57 - before flowering.

+ SECOND APPLICATION

Apply as a foliar spray at BBCH73 - at fruit set.

+ THIRD APPLICATION

Apply as a foliar spray at BBCH79 - during ripening.

*This approach ensures the plants receive support at critical growth stages.
The results are based on StimBlue+ suggested application rates and calendars





RESULTS EXPLAINED



EUROPE

GRAPE CULTIVATION IN EUROPE

Europe, with a long and rich history of grape and wine cultivation, has developed thousands of native grape cultivars. As of 2024, Europe is home to around 3.3 million hectares of vineyards, just over half of the world's vineyards, with Spain (930k), France (783k) and Italy (728k) as leading contributors.³ Other notable contributors are Portugal, Germany, Greece, Hungary, Romania and Bulgaria. Together, Europe produces 60% of the world's grapes and, on average, over half of all wine globally.³

Wine grapes dominate in Europe, with just 5-8% vineyards dedicated to table and dried grapes combined. Key table grape-producing countries include Italy (40% of EU production), Spain, and Greece.⁷ Grape yields tend to average between 8-11 tonnes/ha, but yields differ widely between intensive table grape production (higher yields) and premium wines (lower yields).

Grapes are grown across various climatic regions in Europe, but the top-producing regions are typically Mediterranean with hot, dry summers and mild winters. European growers are increasingly experiencing the negative impacts of climate change on their vines, with prolonged heat waves, drought, spring frosts, hailstorms, and increased disease pressure.⁸ For example, French 2025 wine output fell 13% from the five-year average due to excessive heat and drought, with similar challenges across wine-producing regions.⁹

Existing trials



ABOUT THE TRIAL

TRIAL CONDUCTED BY

ideagro

LOCATION OF TRIALS



SPAIN
Murcia



SEASON

MAY – OCT 2022



MACROCYSTIS VS ECKLONIA

CLIMATE

Temperate - dry summer, hot

+\$8,515

increase in economic returns
per hectare (StimBlue+ 2L/ha)

+15–36%

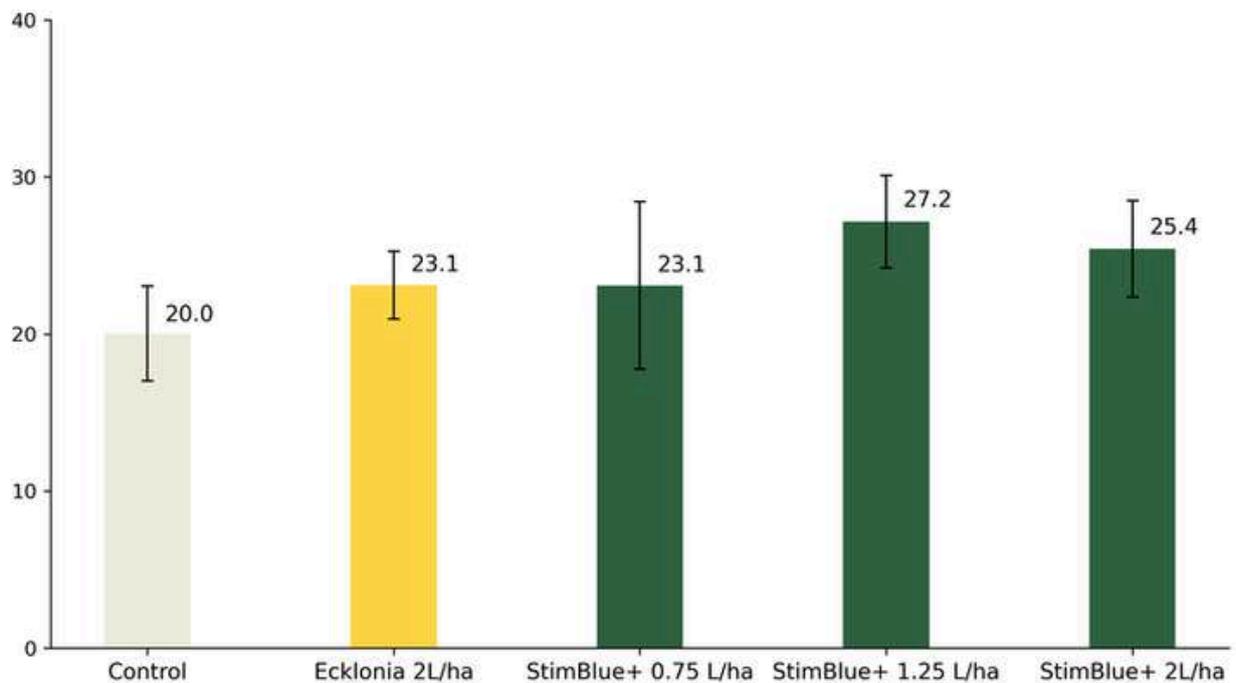
increase in yield

YIELD

- + Throughout the different harvests, plots treated with StimBlue+ consistently showed a greater yield compared to control and competitor, highlighting the positive effect of StimBlue+ for uniformity of maturity.
- + Vines where StimBlue+ was applied at 1.25 L/ha had 36% greater yield compared to standard cultivation practices (control).

Control
Competitor
StimBlue+

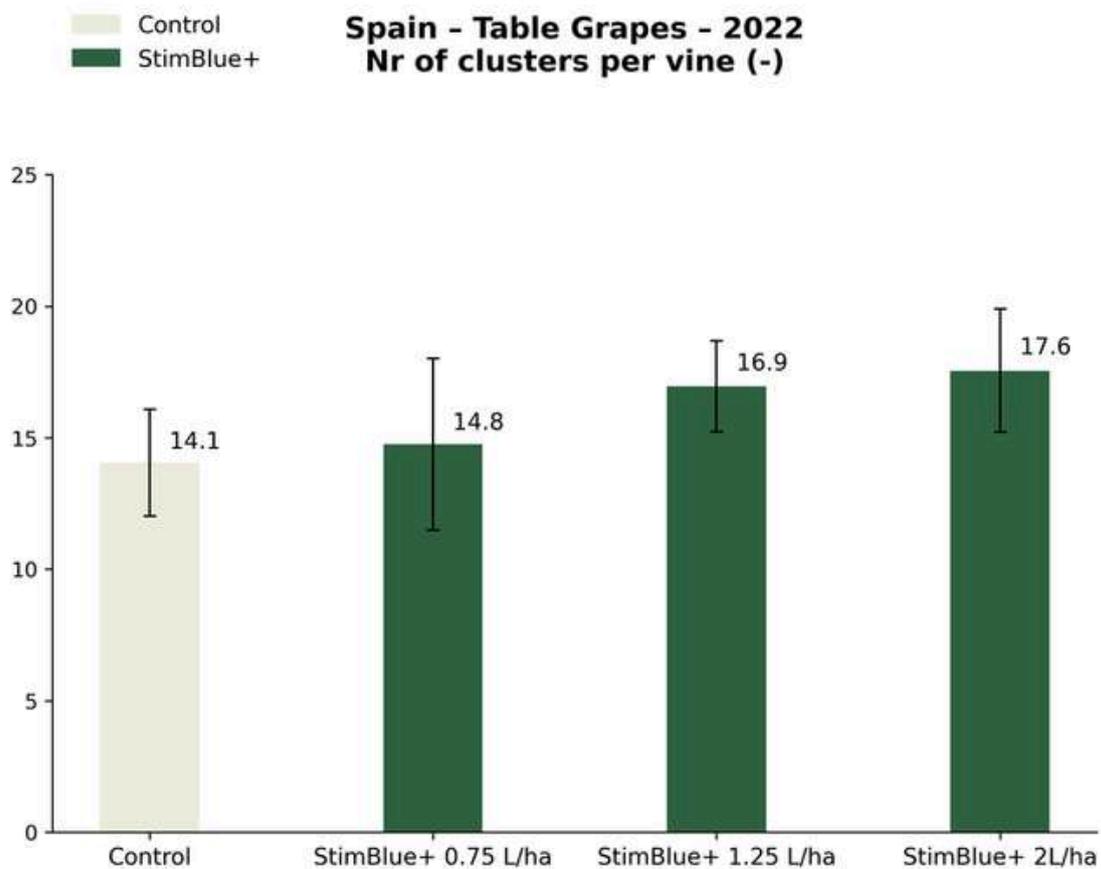
Spain - Table Grapes - 2022
Yield (t/ha)



NUMBER OF CLUSTERS PER VINE



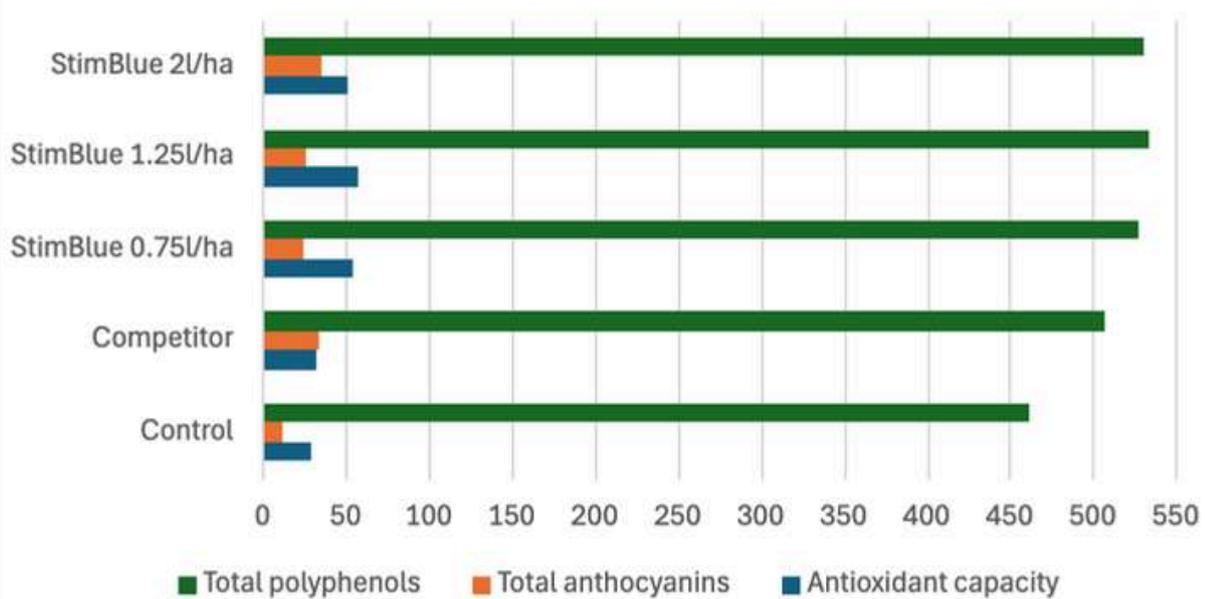
Applying StimBlue+ at 1.25 L/ha and 2 L/ha yielded an increase between +5% and +25% more fruits compared to control. Especially for the first assessment, vines treated with StimBlue+ have a higher fruit precocity and development time. This will positively affect the nutraceutical profile of the upcoming fruits.



NUTRACEUTICAL QUALITIES

- + The aromatic profile of table grapes plays a crucial role in determining their quality and consumer appeal by measuring the antioxidant activity, total polyphenols and total anthocyanins. Vines treated with StimBlue+ significantly enhanced the concentration of these precious compounds.

Aromatic Profile



ABOUT THE TRIAL

TRIALS CONDUCTED BY

BIOME MAKERS  Champagne Experimentation

LOCATION OF TRIALS



FRANCE

SEASON

MAR – OCT 2024 & 2025



CONTROL



STIMBLUE+

The soil microbiome plays a critical role in optimising crop yields, nutrition and stress resilience. To assess the impact of StimBlue+, our liquid seaweed extract, on the microbial pathways essential for wine grape development, we partnered with Biome Makers, a leader in assessing soil health at scale. Through their rigorous soil eDNA analysis, we examined the significant influence of StimBlue+ on enhancing soil microorganisms and nitrogen pathways – contributing to vine performance. The following year, together with Champagne Experimentation, we examined pest severity and pest incidence, with results indicating StimBlue+'s effectiveness on pest management.

+200%

Increase in nitrogen pathways
(StimBlue+ 2L/ha)

+ Nitrogen availability

+ Pest management

MAIN TAKEAWAYS

Farmers applied StimBlue+ through foliar spraying at the recommended dosage of 2 L/ha. Biome Makers focused on assessing soil's microbiome DNA while Champagne Experimentation measured pest severity and incidence. The results? Enhanced activity of microorganisms in the soil and a positive impact on pest management.

NITROGEN FIXATION

StimBlue+ enhances nitrogen availability by +200% by triggering plants to release signalling molecules that attract nitrogen-fixing bacteria, responsible for cycling, unlocking and retaining it in the soil. This was categorised as a “big change with statistical significance” between untreated and treated plots and was witnessed among all the different time assessments. The fixed nitrogen is then efficiently converted into amino acids and proteins, fuelling plant growth and development.

PEST MANAGEMENT

Plants treated with StimBlue+ benefit from increased populations of natural insecticides, nematicide agents, which are fungal antagonists. These beneficial organisms provide an effective form of biological control, reducing the need for chemical pesticides and offering a more sustainable approach to pest management. An increase of up to +223% was witnessed compared to untreated plots.

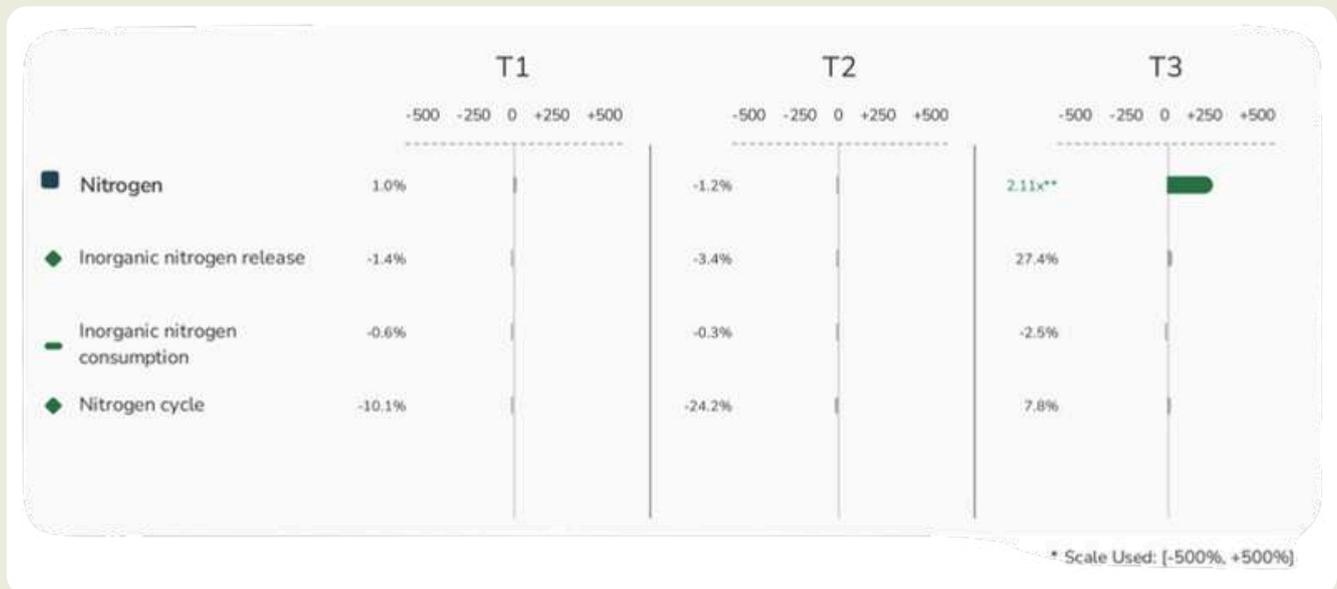


“With StimBlue+, we saw a unique boost in nutrient availability. Even through foliar application, BeCrop analysis confirmed these effects across fields, highlighting the reach and effectiveness of this biostimulant.”

JUAN REBORI
BIOME MAKERS

NITROGEN PATHWAYS

- + Soil nitrogen transformation is deeply connected with plant growth and is fundamental to healthy ecosystem functioning. Understanding nitrogen transformation in soil is important to defining nitrogen utilisation by plants.



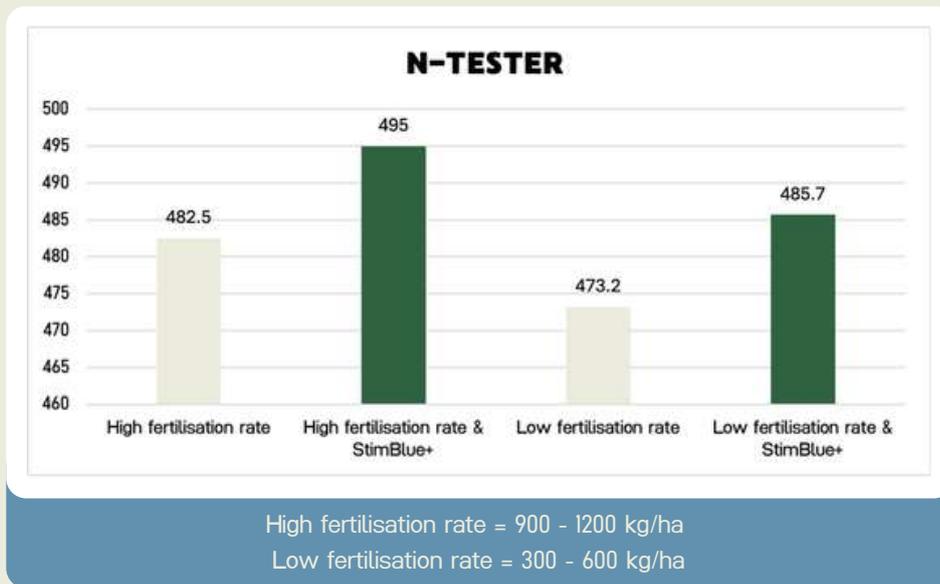
**90% statistical significance in the assessment

- + According to the data analysis executed by Biome Makers combining soil microbiome DNA, environmental data, and machine learning, a ~200% increase in nitrogen pathways was witnessed in the plots treated with StimBlue+.

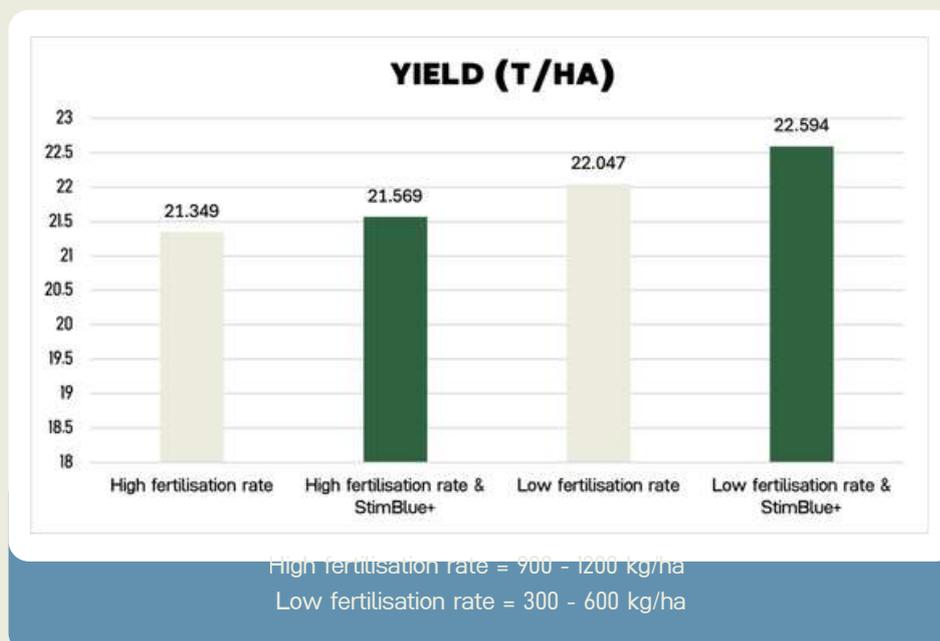
- + By mobilising the nitrogen-fixing community bacteria (e.g., Rhizobia, Azotobacter and Cyanobacteria), StimBlue+ supports more nitrogen to become available to plants. Through the process of nitrogen fixation, nitrogen gas is converted into ammonia, which plants can then assimilate, or in other words, use to make food (energy). By enhancing N pathways, StimBlue+ boosts plants' ability to use nitrogen more efficiently, which has a positive effect on yield.

NITROGEN PATHWAYS

- + The improved Nutrient Use Efficiency for plots treated with StimBlue+ was recorded again in 2025 in experiment with Champagne Experimentation using different fertilisation rates per hectare



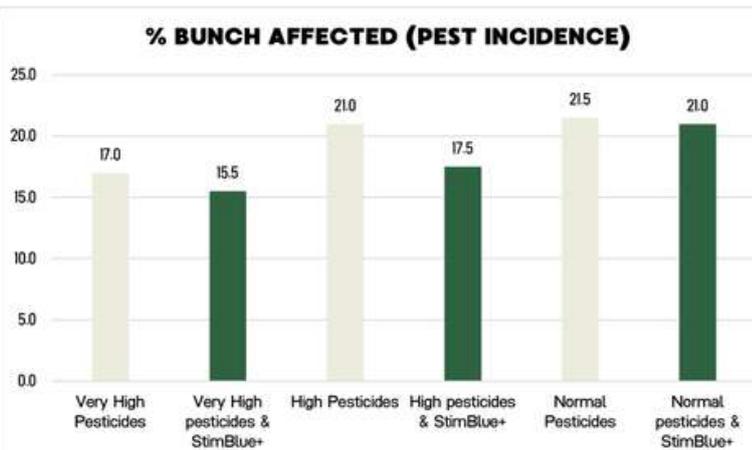
- + Across the different fertilisation rates, vines treated with StimBlue+ showed higher nitrogen (N) values, proving StimBlue+ effectiveness in making macro-elements in soil more available for plant absorption. A higher N content positively affects the photosynthesis structure, leading to stronger and healthier vines, and resulting in greater harvest.



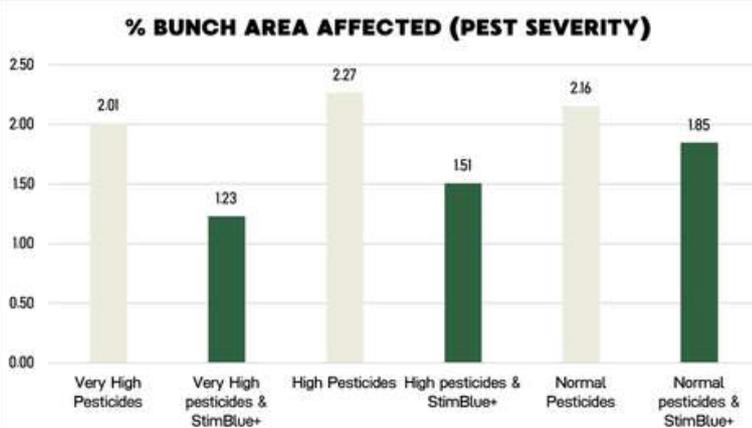
PEST MANAGEMENT

+ While conducting a trial with a French winegrowers cooperative, a widespread downy mildew outbreak was recorded in the region. We had the opportunity to measure the effectiveness of StimBlue+ on downy mildew maintenance. Main variables measured:

- **Pest severity:** the number of bunches affected by disease; percentage of relevant organ covered by symptom or damage. This gives insights into the extent of damage caused by the disease.
- **Pest incidence:** the proportion of bunches diseased. This indicates the prevalence of the disease in a given area or host population.



Researchers recorded a positive trend when StimBlue+ was applied for lessening the amount of bunches affected by downy mildew.



ABOUT THE TRIAL

TRIAL CONDUCTED BY

Champagne
Experimentation

LOCATION OF TRIALS



FRANCE

Champagne



SEASON

**APRIL – OCT
2023, 2024, & 2025**

TRIAL TYPE

3 years in the same site
vs Ascophyllum

SOIL TYPE

CLAY

3 YEARS OF INCREASED YIELD

Changes in climate, pest and disease conditions make for varying harvestable yields year-to-year. Still, StimBlue+ at 2/ha consistently increased yields vs. control, thereby increasing additional economic returns per hectare for growers.

2023

16,6 t

+25%

+\$13,385

2024

6,34 t

+36%

+\$6,710

2025

11,6 t

+6%

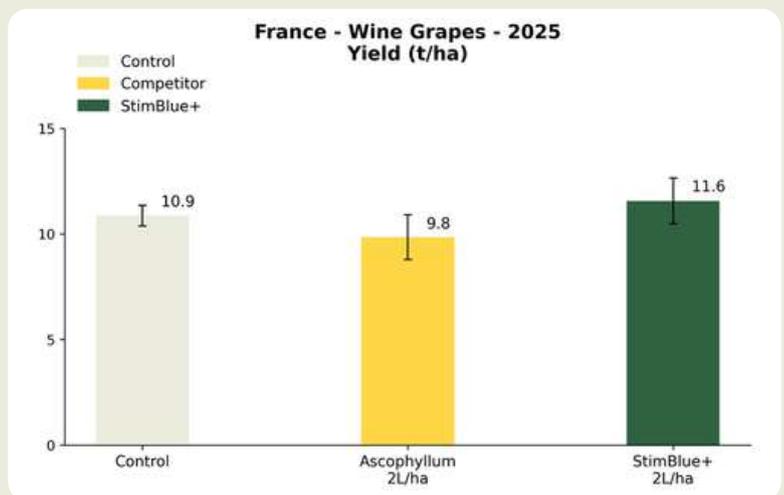
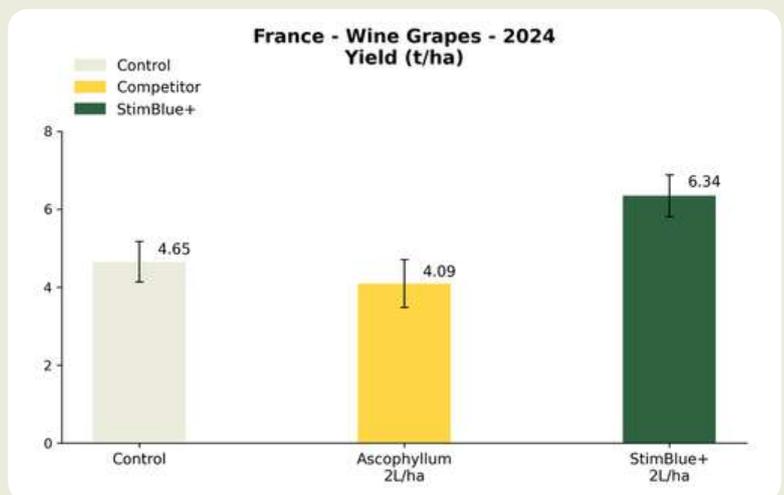
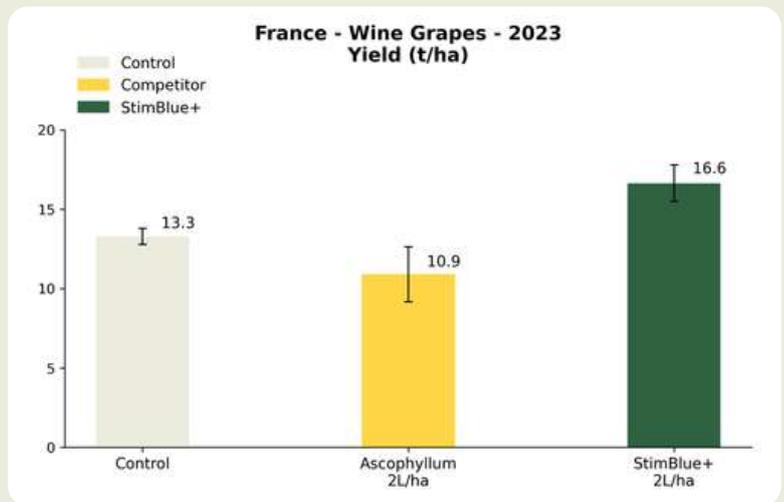
+\$2,490

*Economic returns: StimBlue+ at 2 L/ha based on a typical farm gate price of \$3,660/t/ha in 2024.

YIELD



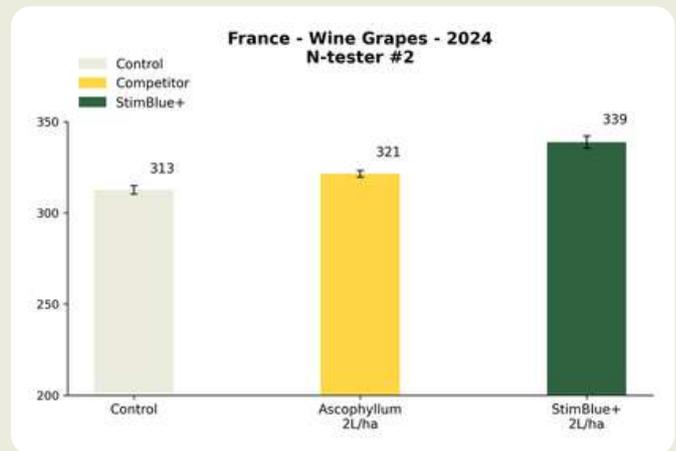
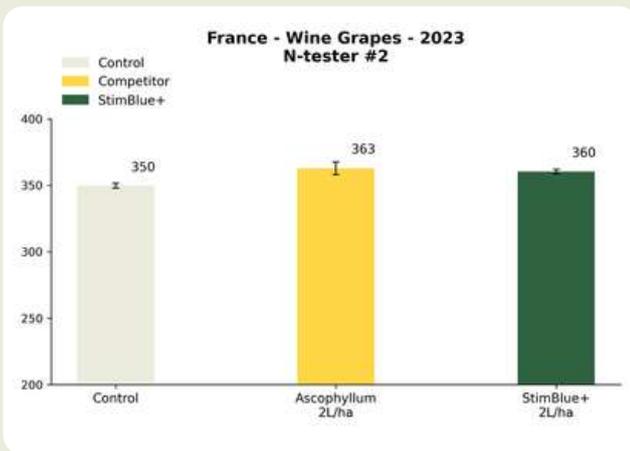
Throughout the harvests in 2023, 2024, and 2025, plots treated with StimBlue+ at 2 L/ha showed an average of 23% greater yields compared to the control and competitor.



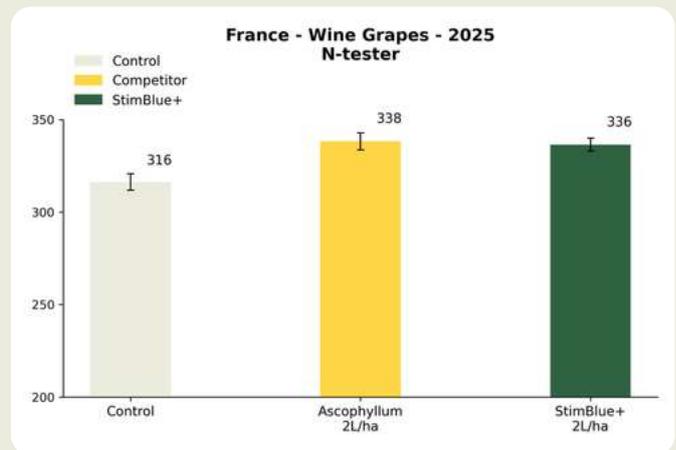
The 2024 and 2025 growing seasons posed many challenges to farmers, including heavy rains, extreme heat and rise in powdery mildew. These conditions can help to explain the difference in yield between the years. Still, vines treated with StimBlue+ consistently outperformed the control and the competitor, showcasing how StimBlue+ works well for plants under abiotic stress. Champagne Experimentation observed that after several years of biostimulant application on the same plots, yield gains tend to stabilise – a sign that the soil and vines have reached an optimal balance. This suggests that, over time, a lower inclusion rate may be sufficient to maintain performance.

N-TESTER

- + The N-Tester handheld device was used to measure the nitrogen status of grapevines by assessing leaf chlorophyll content, which correlates with nitrogen levels. It provides quick, non-destructive readings that help optimise nitrogen application, enhancing grape quality and yield. The N-Tester is particularly useful at the veraison stage when the plant switches from vegetative to reproductive stage, meaning an adequate level of nutrients (N in this case) is required.



In all assessments, StimBlue+ showed greater results compared to the control. This can also be witnessed by the “greener” colour of the plants treated with StimBlue+ when compared to other treatments.



ABOUT THE TRIAL

TRIAL CONDUCTED BY



LOCATION OF TRIALS



FRANCE

Marne



SEASON

**MAY – SEPTEMBER
2025**

CLIMATE

TEMPERATE

no dry season, warm

SOIL TYPE

CLAY



**MACROCYSTIS
VS ECKLONIA**



**FERTILISER
DEFICIT**

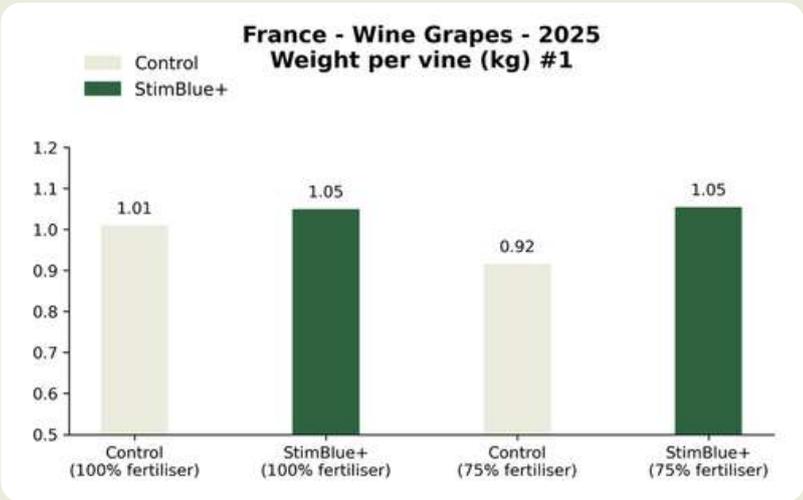
-15%

Reduced fertiliser enabled by
StimBlue+ while maintaining yield

+\$1,315 – \$4,540

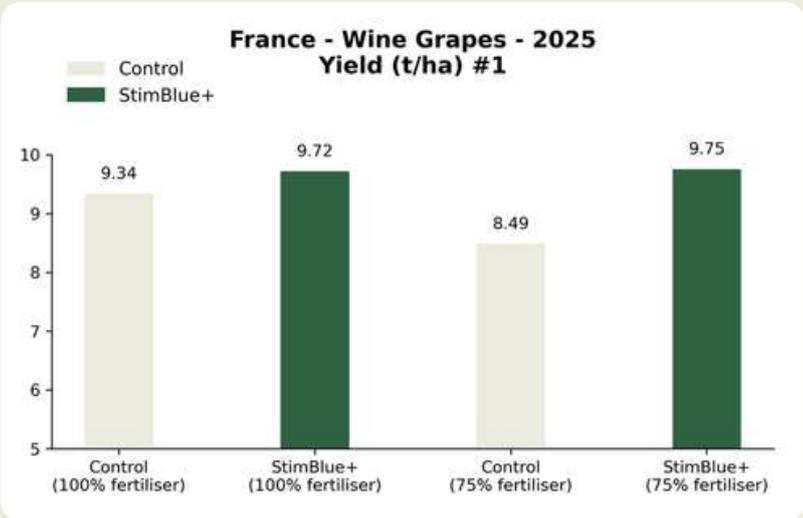
increase in economic
returns per hectare

YIELD



+

Even when vines received 15% less fertiliser, vines treated with StimBlue+ showed increased weight per vine and yield beyond the control group at full nutrient availability.



+

These yield gains of +4-14% translate into increased economic returns for the farmer of between \$1,315 and \$4,540 based on current farm-gate prices.*

*Economic returns were calculated based on an average farm-gate price of \$3,000 per tonne.

ABOUT THE TRIAL

TRIAL CONDUCTED BY



LOCATION OF TRIALS



FRANCE

Grau du roi



SEASON

**MAY – SEPTEMBER
2025**

CLIMATE

TEMPERATE

dry summer, hot

SOIL TYPE

SAND

TRIAL TYPE

YOUNG DEVELOPMENT

+18%

greater root dry weight
vs control

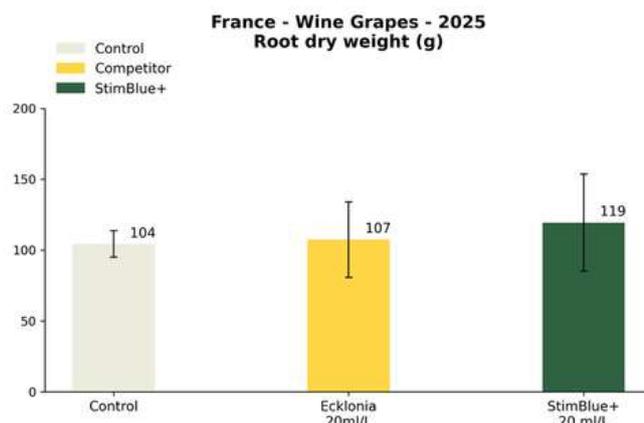
+ Plant establishment

+ Root growth & development

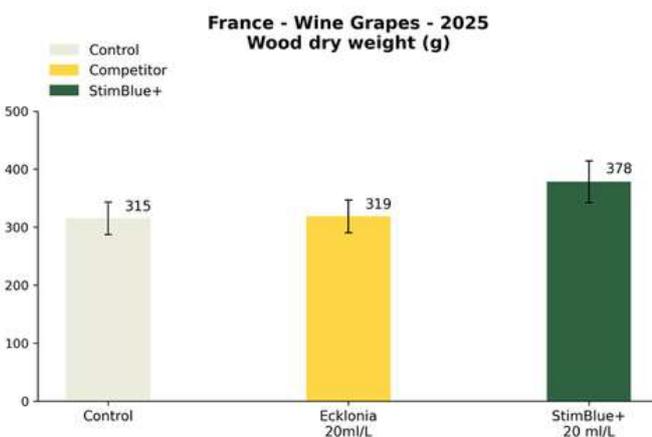
PLANT GROWTH AND ESTABLISHMENT



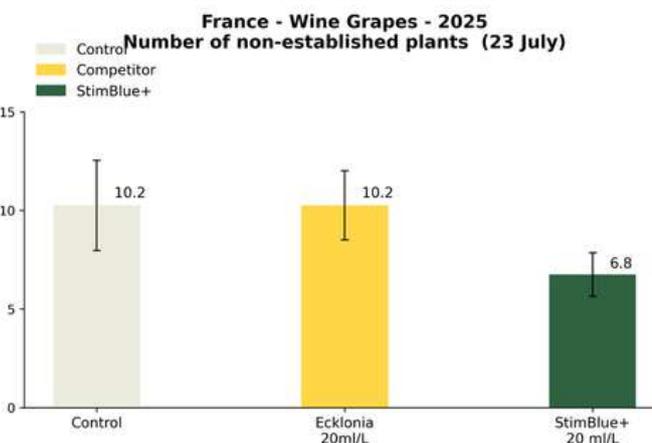
StimBlue+ increased the root dry weight and wood dry weight of vines, determinants of enhanced crop vigour.*



Two months after planting, plants treated with StimBlue+ showed 34% fewer non-established plants compared to the control and an Ecklonia-based competitor.



By supporting grapevines' early development and growth via increased root and wood dry weight, StimBlue+ boosted the number of established plants. These plants have a higher likelihood of producing higher-quality grapes at harvest.



*Higher wood and root dry weight in young, developing vines indicates greater overall crop vigour and a stronger vine capable of producing higher-quality fruit. Wood, found in the vines and trunks, is the grapevines' primary reservoir for stored carbohydrates and nutrients (such as nitrogen, potassium, and phosphorus) that fuel early-season growth. Meanwhile, the dry weight of roots reflects the plant's capacity to store energy, absorb water and take up nutrients, which directly affect the robustness of the plants' canopy and its structural development.¹⁰

ABOUT THE TRIAL

TRIAL CONDUCTED BY



LOCATION OF TRIALS



ITALY
Sicily



SEASON

APRIL - AUG 2025

CLIMATE

TEMPERATE

dry summer, hot

SOIL TYPE

SAND



UNDER IRRIGATION STRESS

+\$5,045

increased economic
returns per hectare

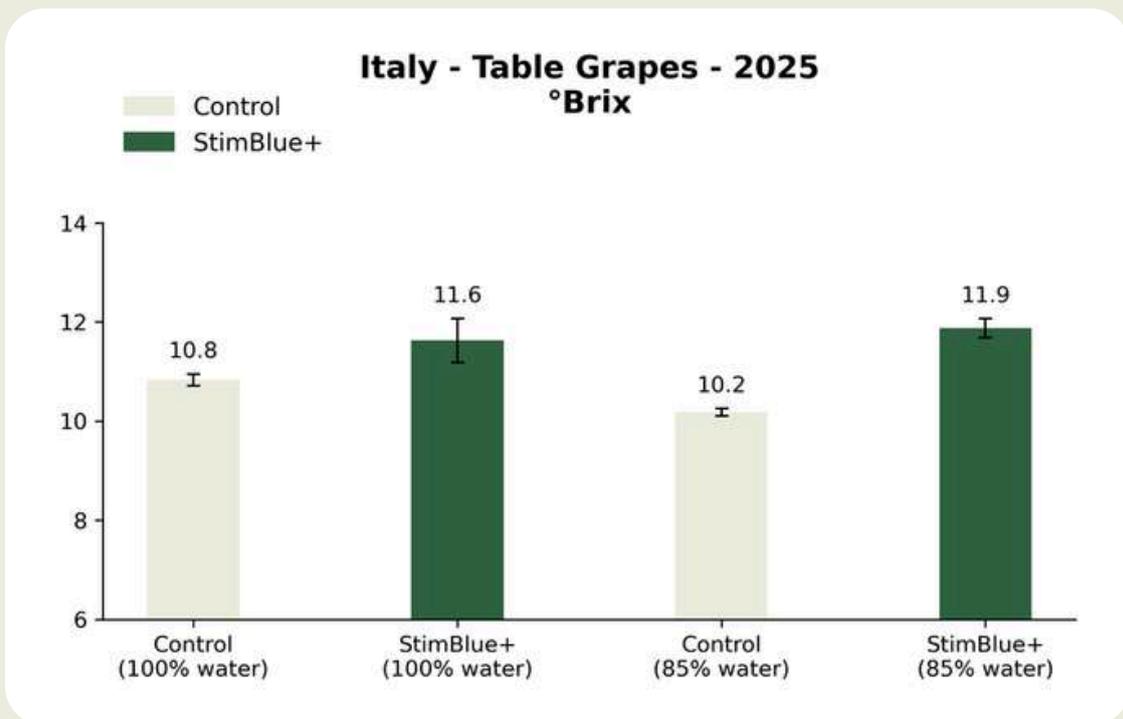
-15%

reduction in irrigation enabled by
applying StimBlue+

SUGAR CONTENT

Researchers found significant differences in sugar content between the treatments in a trial on table grapes in Italy. Sugar content is measured in degrees Brix and is a determining factor in the concentrates industry, where sweetness and sugar levels are critical.

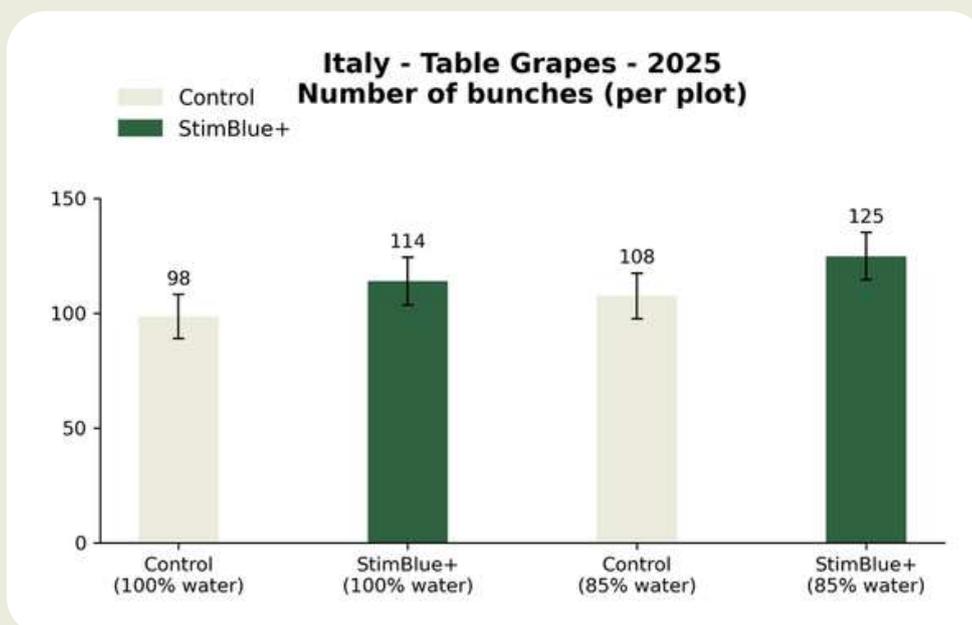
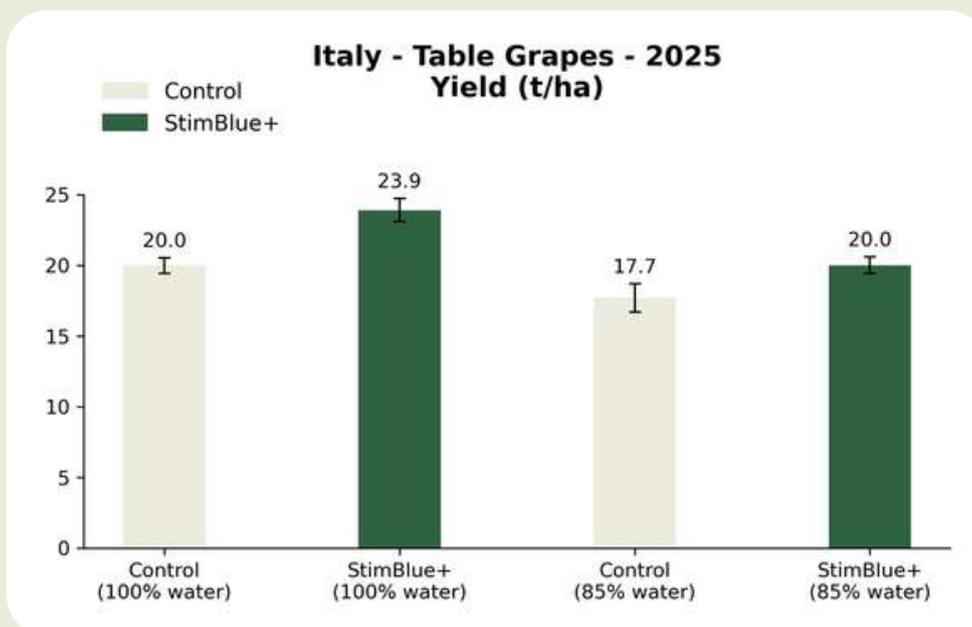
- + Generally, the higher the Brix of a product, the sweeter it is, positively stabilising product colour, acidity, texture and consistency. Grapes with higher Brix can also achieve a higher shelf life (with proper storage).



- + When irrigation levels were reduced by 15%, plots treated with StimBlue+ increased grapes' sugar content by 10% compared to the untreated control group with full irrigation.

YIELD

- StimBlue+ showed to have significant positive effects on vine performance at harvest. Even when irrigation levels were reduced by 15%, vines treated with StimBlue+ matched the control plot's yields at full irrigation and produced 27% more bunches.



- At the current economic evaluation*, 3 applications of StimBlue+ (2 L/ha) per season can increase economic returns by +\$5,045 per hectare.

*Economic returns were calculated based on an average farm-gate price of \$1,390 per tonne.

SOUTHERN AFRICA



kelp blue

GRAPE CULTIVATION IN SOUTHERN AFRICA

In Africa, grape cultivation is most common in the south, in Namibia and South Africa. In 2023, over 38M tonnes of grapes were produced in Namibia, spanning over 9,000 hectares.⁴ In the same year, over 111,000 hectares, 1.9B tonnes of grapes were produced in South Africa, and of these, 365M tonnes were table grapes.¹¹

South Africa produces both table and wine grapes, but is a leading exporter of table grapes, accounting for 8% of global exports,¹² valued at USD 1 billion in 2024. Within South Africa, the Western Cape province produces 61% of all national output of table grapes, with the Northern Cape following in production.¹² In 2023, grape production fell by 14% as growing regions faced high disease pressure due to high rainfall and flooding that led to crop losses.¹³ Growers' cash flow constraints have also led to the area planted to wine grapes being at its lowest since 1997. Taken together, these factors have led to the lowest wine grape production (in 2024) since 2002.¹⁴

In Namibia, the most recognized table grape-growing region is the Aussenkehr Valley, located along the northern bank of the Orange River.¹⁵ Grapes account for over half of Namibia's agricultural exports, representing 1.36% of the global share, valued at USD 84M.¹⁶ Namibian grape growers also face challenges with extreme heat and drought, limited water availability for vines.¹⁷

EXISTING TRIALS: SOUTH AFRICA



ABOUT THE TRIAL

SynTech
Research

LOCATION OF TRIALS



SOUTH AFRICA

Western Cape



SEASON

OCT 2024 – MAR 2025

CLIMATE

TEMPERATE

dry summer, warm

SOIL TYPE

CLAY LOAM



MACROCYSTIS VS ECKLONIA

+\$3,370

increased economic
returns per hectare

+14%

greater yields
(StimBlue+ 2 L/ha vs. competitor)

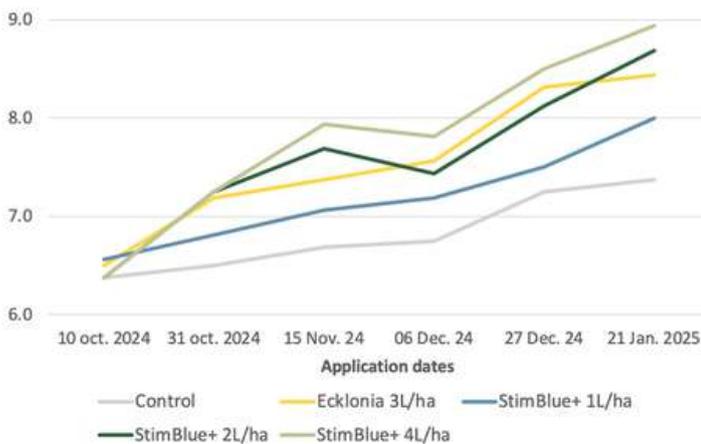
CROP VIGOUR

+ Stronger and more resilient plants.

Crop vigour reflects the overall **health and growth of plants**, and is shaped by a combination of factors including nutrient availability, soil characteristics and water conditions. Greater crop vigour supports plant establishment, growth and resistance to stress,³ leading to higher harvests.⁴

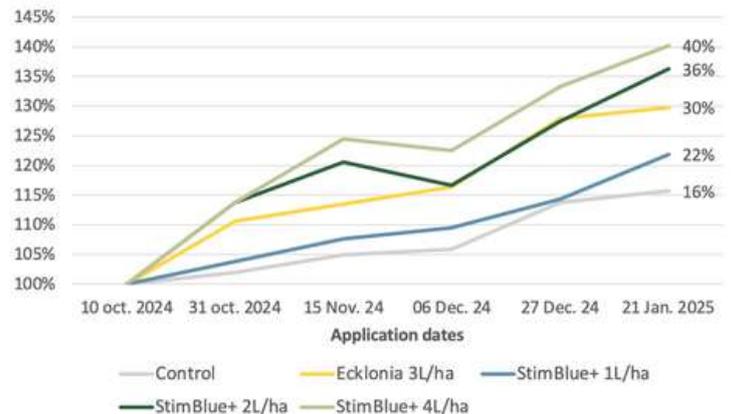
+ Plots treated with StimBlue+ showed greater vigour compared to the control and competitor, with a **+36%** relative development from the first application of StimBlue+ at 2 L/ha dosage.

Crop vigor (1-10)



Crop vigor was assessed on a scale of 1 - 10 (1 = crop dead, 10 = excellent condition).

Crop vigor relative development



Crop vigor increased by 36% from the first application until harvest.



SUGAR CONTENT



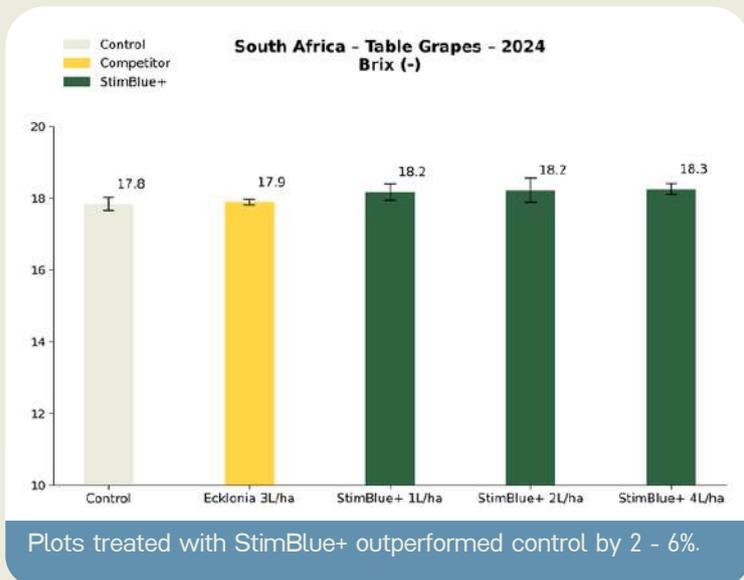
Noticeable effect on quality parameters such as chlorophyll content and Brix.

Greater vigour showcased throughout the trial lifecycle was among the main contributors to **higher levels of chlorophyll***, a key indicator of quality.

Researchers also found **significant differences in Brix*** between the treatments. Brix is a determining factor in the concentrates industry, where sweetness and sugar levels are critical.



Generally, the higher the Brix of a product, the sweeter it is, positively stabilising product colour, acidity, texture and consistency. Grapes with higher Brix can also achieve a higher shelf life (with proper storage).



*Chlorophyll content is measured through the SPAD index.

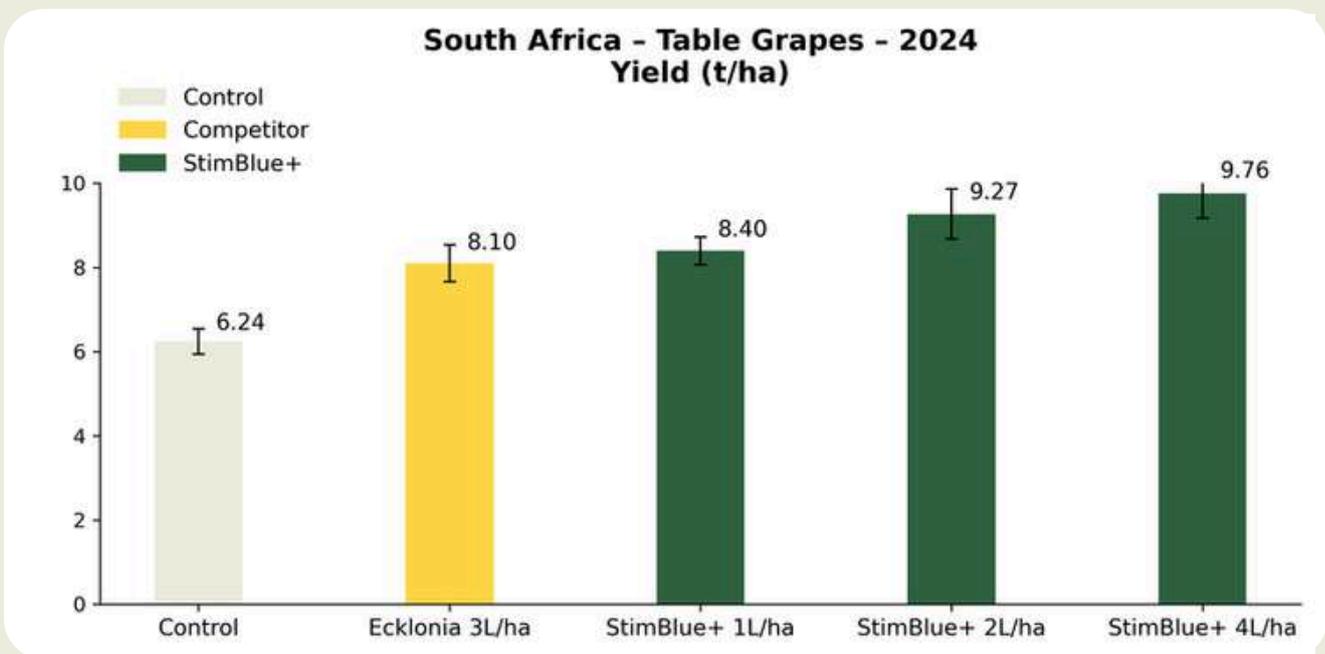
*Sugar content is measured by degrees Brix.

HIGHER YIELDS

Healthier and stronger fruits with elevated rates of photosynthetic activity generated greater harvests with more and heavier bunches per vine.

+ The application of StimBlue+ at 2 L/ha showed 14% greater yields compared to the competitor at its recommended rate of 3 L/ha.

+ At the current economic evaluation*, 3 applications of StimBlue+ (2 L/ha) per season can increase economic returns by +\$3,370 per hectare.



*Economic returns were calculated based on farm gate price of \$2,915 per tonne.⁵



UNITED STATES

GRAPE CULTIVATION IN THE USA

The United States produces 7% of the world's grapes, with most production taking place in California (85%), followed by New York and Washington. Grapes are the 6th largest crop in the USA,¹⁸ with vineyards spanning over 373,000 hectares and producing 5.6M tonnes.¹¹

The USA produces 3% of the world's table grapes at 845,000 tonnes spanning 48,600 hectares.¹⁹ The USA produces even more wine grapes and is the world's fourth-largest wine producer. In 2024, US wine production was 16% below the five-year average.³ Extreme heat and inventory pressures led to one of the lowest production levels in the past 15 years.³ Notably, California's grape harvest has been the smallest since 2004.

EXISTING TRIALS: CALIFORNIA, USA



ABOUT THE TRIAL

TRIAL CONDUCTED BY
BIOME MAKERS

LOCATION OF TRIALS



UNITED STATES
California

SEASON

MARCH - OCT 2024

- + Nitrogen availability
- + Calcium mobility & transport
- + Disease resistance & management



CONTROL



STIMBLUE+

The soil microbiome plays a critical role in optimising crop yields, nutrition and stress resilience. To assess the impact of StimBlue+, our liquid seaweed extract, on the microbial pathways essential for wine grape development, we partnered with Biome Makers, a leader in assessing soil health at scale.

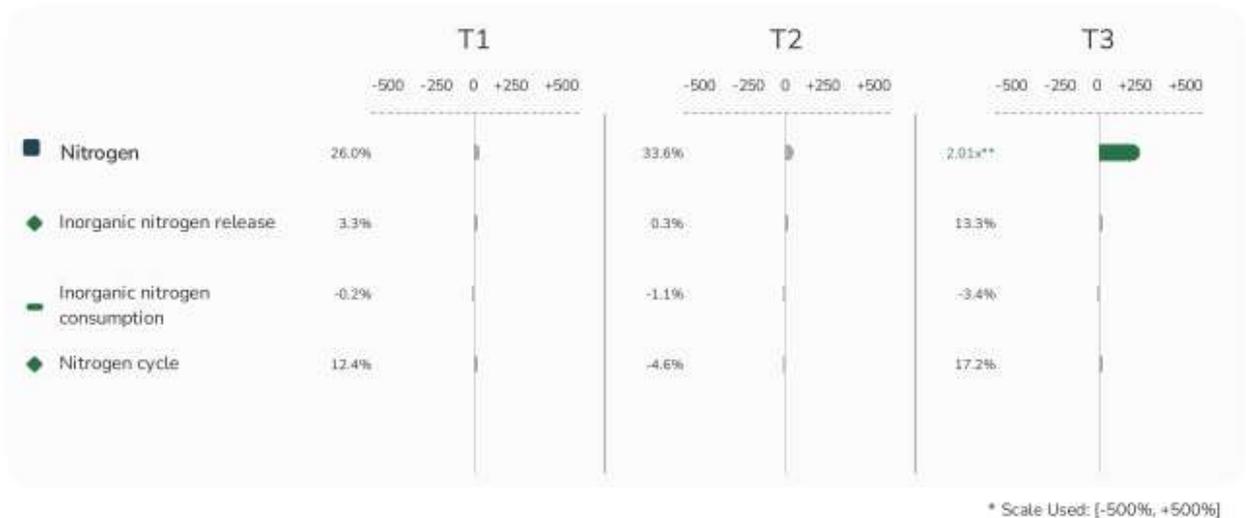
Through their rigorous soil eDNA analysis, we examined the significant influence of StimBlue+ on soil microorganisms, providing incredible insights into how our product enhances soil health and vine performance.

+200%

Increase in nitrogen pathways
(StimBlue+ 2L/ha)

NITROGEN PATHWAYS

- Soil nitrogen transformation is deeply connected with plant growth and is fundamental to healthy ecosystem functioning. Understanding nitrogen transformation in soil is important to defining nitrogen utilisation by plants.



**90% statistical significance in the assessment
*80-90% statistical significance in the assessment

- According to the data analysis executed by Biome Makers combining soil microbiome DNA, environmental data, and machine learning, a ~200% increase in nitrogen pathways was witnessed in the plots treated with StimBlue+.

- By mobilising the nitrogen-fixing community bacteria (e.g., Rhizobia, Azotobacter and Cyanobacteria), StimBlue+ supports more nitrogen to become available to plants. Through the process of nitrogen fixation, nitrogen gas is converted into ammonia, which plants can then assimilate, or in other words, use to make food (energy). By enhancing N pathways, StimBlue+ boosts plants' ability to use nitrogen more efficiently, which has a positive effect on yield.

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ABOUT STIMBLUE+

StimBlue+, a biostimulant made from 100% cultivated Giant Kelp (*Macrocystis pyrifera*), has shown to be a great solution for grape cultivation. The trial data suggests that it offers significant, positive effects on quality and yield.

We plant kelp forests around the globe to boost the health and biodiversity of the oceans while locking away CO₂, and producing products to offer sustainable alternatives to help transition agriculture to more sustainable practices.



FIND MORE INFORMATION

<https://www.kelp.blue/global/field-trial/wine-grapes>



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