



TRUBIOL

Plant Antifreeze & Plant Anti-Heat

About us

- We are a Belgium-based organization.
- Two biotechnology laboratories located in Limburg-BE and Kayseri-TR
- Develop innovative solutions for Agriculture, Environment, Health and Energy sectors.
- We have patented solutions and academic publications in these areas.
- In addition to TruBiol for the agricultural sector, we continue our R&D projects on Bio-Pesticide, Bio-Sensors, Bio-Fortification.



What is the problem?

Agricultural Frost

Damage to the flower or fruit on the plant due to temperatures dropping below 0°C is referred to as **agricultural frost**. The occurrence of agricultural frost in industrial agricultural products can lead to significant damage for the producer.

Over-heating

Over-heating, defined as above-average temperatures, negatively impacts plant growth and development. It disrupts photosynthesis, respiration, water balance, and can lead to yield loss, reduced quality, and plant death.



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What is the problem?

28 May 2022 40% yield loss in hazelnut due to frost, in Carsamba - Turkiye

14 April 2022 80% damage due to agricultural frost. Over 1 billion USD lost
Malatya - Turkiye

19 March 2022 15% yield lost in hazelnuts due to agricultural frost in the Ordu, Giresun
and Trabzon - Turkiye

9 Sep 2023 20% yield lost at tea harvest due to over-heating in Rize, Turkiye



The Solution

TruBiol Plant Antifreeze and TruBiol Plant Anti-Heat



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The Solution

TruBiol Plant Antifreeze and TruBiol Plant Anti-Heat

- Special Formulation with Completely Herbal Content.
- Contains Various Enzymes and Amino Acids.
- Produced from Recycled Vegetable Material.
- Designed at Belgium Biotech Lab & Developed at Turkiye Biotech Lab.
- Zero toxic or synthetic chemicals
- Innovative and Unique formulation



TruBiol Listed As Key Player

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Global Natural Plant Antifreeze Market Growth 2023-2029

Market Research Report Summary

Global Natural Plant Antifreeze Market Growth 2023-2029 report is published on June 29, 2023 and has 90 pages in it. This market research report provides information about Manufacturing (Chemicals), Chemicals industry. It covers Global market data and forecasts. It is priced starting at **USD 3,660.00** for Single User License (PDF) which allows one person to use this report.

Please read the description and table of contents of this research report given below to check whether it meets your research requirements. If not, then please do not hesitate to contact us using "Report Enquiry" form given below. We can customize this research report or suggest a new fully customized market research report to meet your research goals and data requirements.

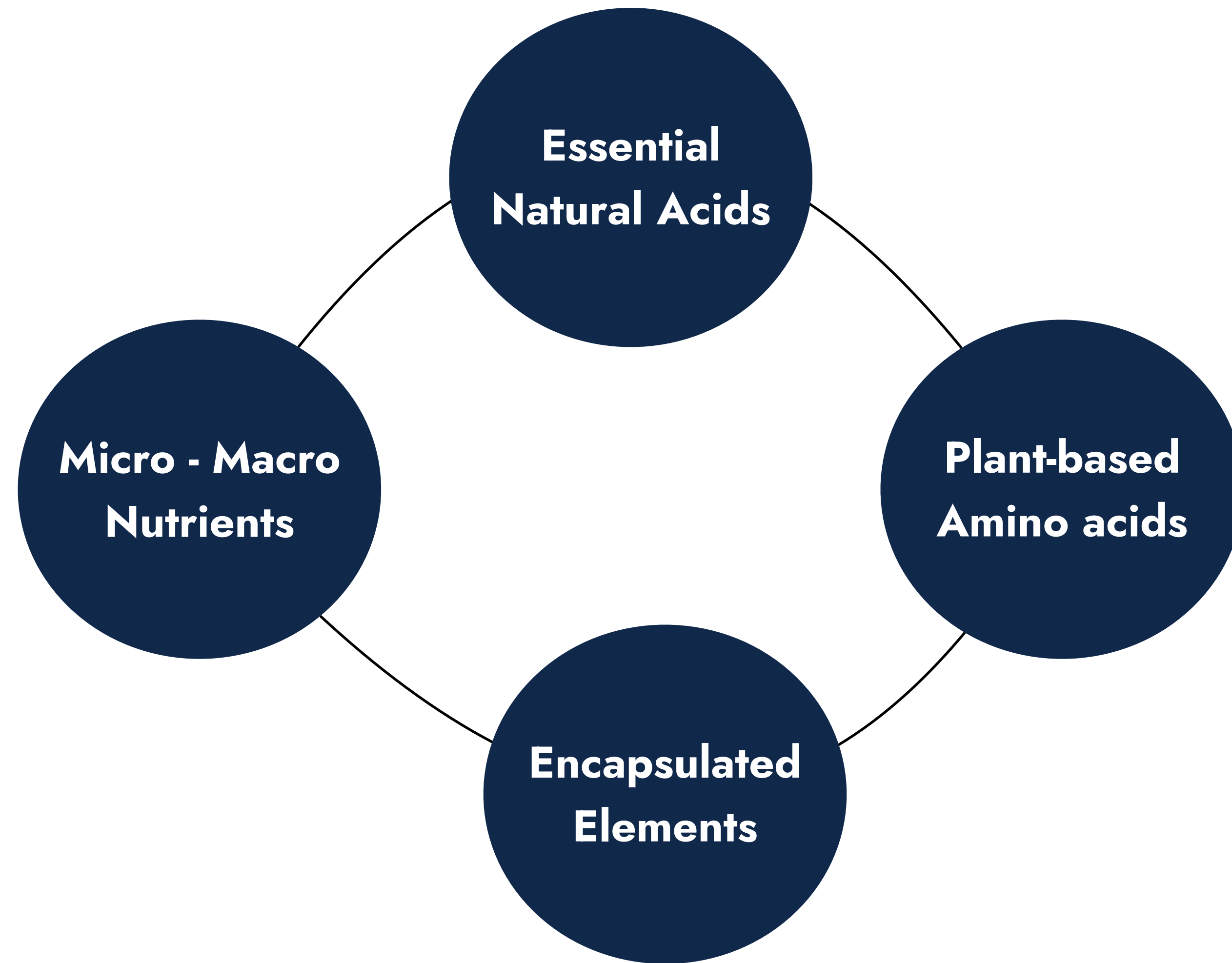
2029, at a CAGR of % from 2023 through 2029.

Global key Natural Plant Antifreeze players cover TruBiol, CropAid International, Wiltpruf, Epono, EHE Century, Nobel Agriculture, Wfxsl and Bisaier, etc. In terms of revenue, the global two largest companies occupied for a share nearly % in 2022.



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Unique Formulation



Advantages of TruBiol

Plan-based Organic
Ingredients

Synthetic
Chemicals-free

Increases
Nitrogen Binding

Leaves No
Residue

Adjust pH
of Soil

Easy
Application

1/200 Dilution
Ratio

Does not Harm
to Personnel

Environment
Friendly

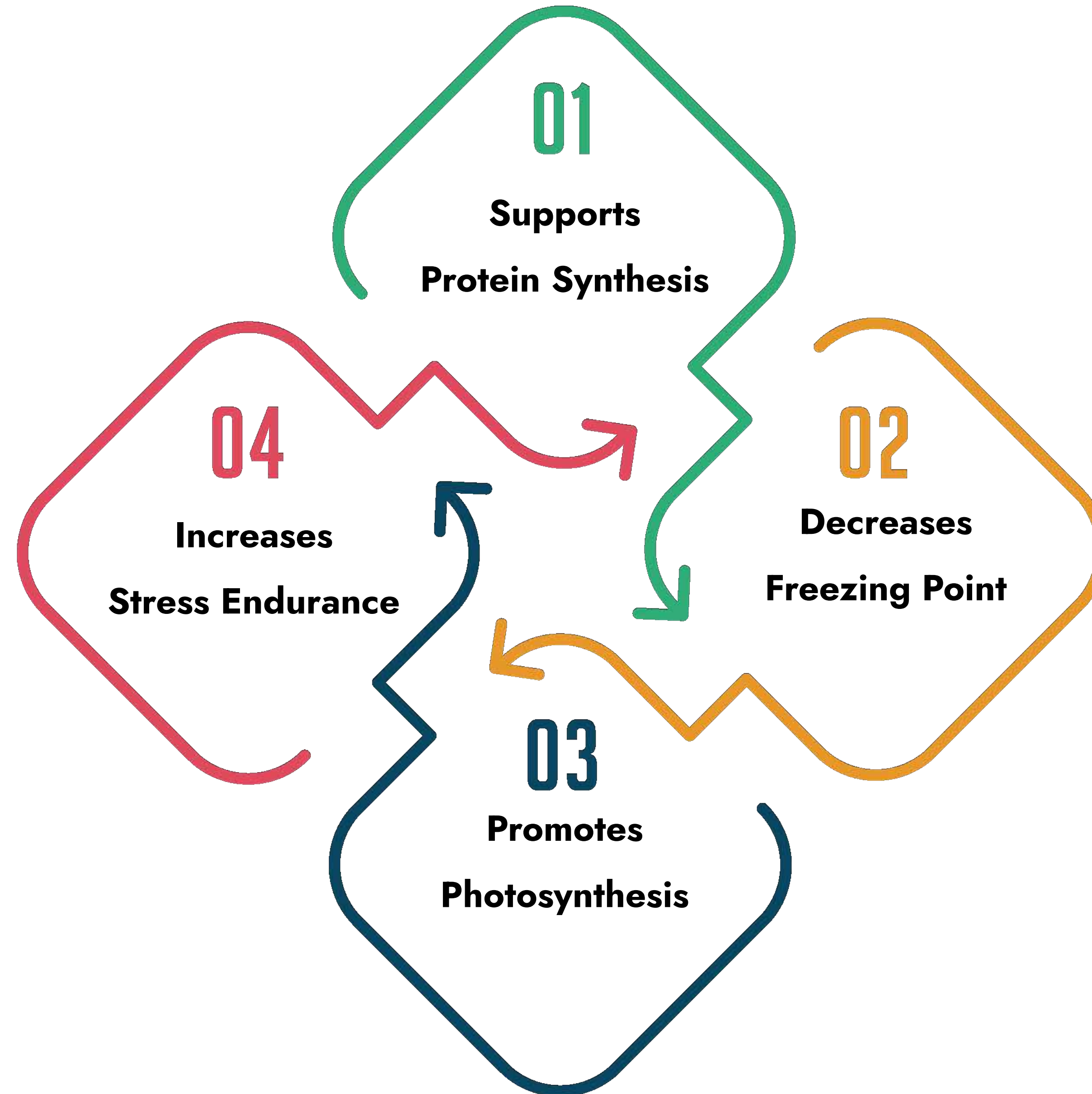
Plant-based
Enzymes





4 Steps of Protection

4 Step of Protection





Field Studies

Field Studies - TruBiol Plant Antifreeze

- In Turkey, between December 2021 and March 2022 TruBiol Plant Antifreeze tested against agricultural frost for;

Plum

Olive

Apricot

Almond

Tomato

- Temperature during the test was reported between -7°C and 3°C degrees
- Test fields were Manisa, İzmir, Iğdır and İstanbul regions of Türkiye

Result: Even agricultural frost was reported three times during the test period, **TruBiol Plant Antifreeze protected trees from the frost.**



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Field Studies - TruBiol Plant Anti-Heat

- In Turkey, between Jun and July 2023 TruBiol Plant Anti-Heat tested against agricultural over-heat for;

Ground Beans

Tomato

- Temperature during the test was reported to +43°C degrees
- Test fields was at Konya regions of Turkiye

Result: Even agricultural over-heat was reported during the test period, **TruBiol Plant Anti-Heat protected crops from the over-heating.**



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Field Studies



Field Studies



TruBiol vs Traditional Applications

Antifreeze Irrigation

Antifreeze Candles

Nebuzilation Application

Mobile Gas Blowers

Wind Turbines

Helicopter



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TruBiol vs Traditional Applications

	Antifreeze Irrigation	Antifreeze Candles	Nebulization	Gas Blowers	Wind Turbines	Helicopter	TruBiol
High Efficiency	✓	✓	X	✓	✓	✓	✓
Ease of Use and Not Expensive	X	X	X	X	X	X	✓
Low Setup Cost and Maintenance Cost	X	✓	X	X	X	X	✓
Not Highly Dependent On Labor	✓	X	✓	✓	✓	X	✓
Effective up to 15 days	X	X	X	X	X	X	✓
Does not cause burns and water loss in the plant	X	✓	✓	X	✓	✓	✓
No Gas Emissions - No No Nutrient Leaching	X	✓	X	X	✓	X	✓
Helps Plants Development	X	X	X	X	X	X	✓



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How to Apply?

Instruction for use

- TruBiol products are concentrated. Can be diluted 1:200 ratio.
- Always dilute TruBiol with pH neutral tap water.
- Check the recommended dilution ratio based on crop.
- Beware of rain and wind free conditions before the application.
- Choose calm wheather conditions.
- Apply at least six hours before frost or over-heating.
- Using an atomizer spray it all over the plant.
- It's not advised to use TruBiol with amino acid breakers like pesticides.
- Bio-mineral content of TruBiol is easily absorbed by the leaves, stems, and roots of plants.



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General Recommended Amount

Type	How to Apply	Coverage
Trees	Dilute 5%. Add 1L TruBiol Plant Antifreeze to 200 L tap water. Spray the solution over the leaves with an atomizer.	5L-6L / Ha
Crops	Dilute 5%. Add 1L TruBiol Plant Antifreeze to 200 L tap water. Spray the solution over the leaves with an atomizer.	4L-5L / Ha
Seeds	Dilute 5%. Add 1L TruBiol Plant Antifreeze to 200 L tap water. Place seeds on a cloth and spray the solution on the seeds with an atomizer.	



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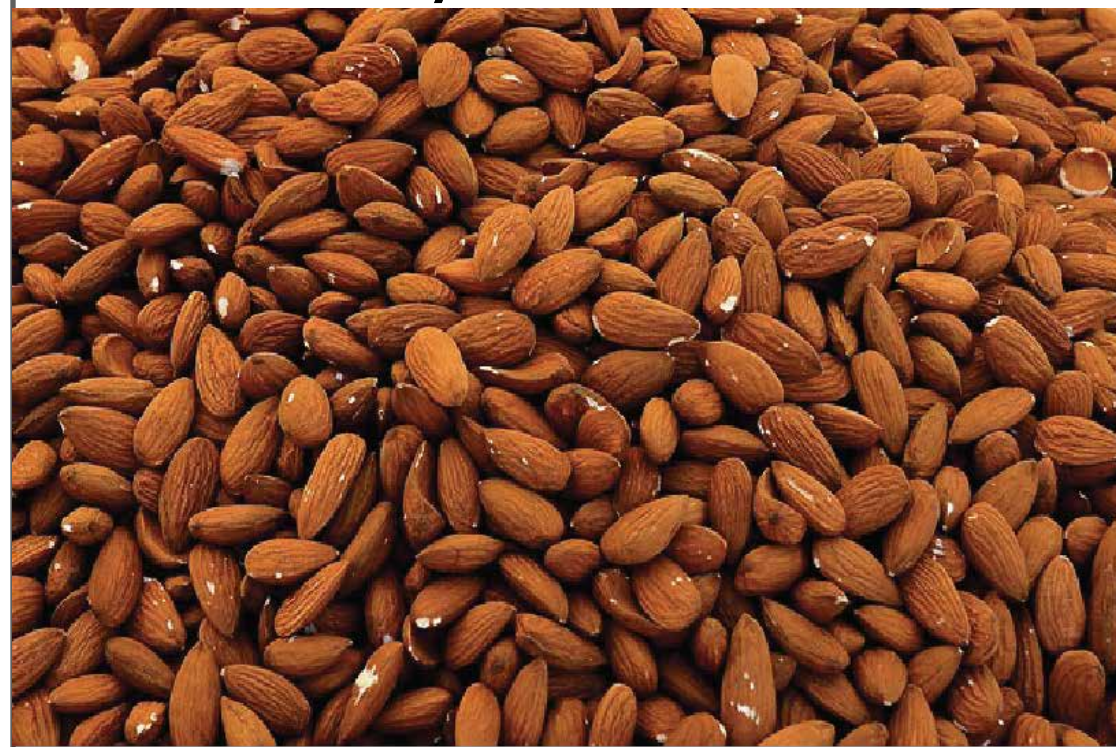
Secondary Benefit

Yield Increase

Yield Increase

After the field test below increase were reported

Almond yield increased
by **43%**



Apricot yield increased
by **35%**



Plum yield increased
by **10%**



Olive oil yield increased
by **18%**



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EGE University Faculty of Agriculture Department of Horticulture Test

Test Objective: The effect of TRUBIOL Plant Antifreeze Product on tomato seedlings under low temperature (0°C for 7 hour) was investigated.

Result: TRUBIOL Plant Antifreeze application was found to increase the adaptation of plants to low temperature stress by decreasing the water potential in the cells of seedlings and increasing the dry matter content of seedlings.



GENEL DEĞERLENDİRME

TRUBIOL Bitki Antifriz solüsyonunun, domates bitkilerinde don olayına karşı koruyucu etkisini belirlemek amacıyla gerçekleştirilen bu denemede Seyran F1 domates çeşidinin fideleri kullanılmıştır.

Don olayını simüle etmek için domates fideleri önce 15°C'de ardından 7 saat 0°C'de tutulmuştur. Yapılan kısa süreli don olayını simüle eden denemede, TRUBIOL Bitki Antifriz uygulamasının etkinliği uygulama yapılmamış kontrol grubu fideler ile fizyolojik tepkileri karşılaştırılarak değerlendirilmiştir. TRUBIOL Bitki Antifriz uygulamasının kısa süreli (7 saat) 0°C'de tutulan domates bitkilerinin yaprak hücrelerinde, membran bütünlüğünü korumada etkili olabileceği belirlenmiştir. Ayrıca TRUBIOL Bitki Antifriz uygulamasının, fidelerin hücrelerinde su potansiyelini azaltarak ve fide kuru madde oranını artırarak, düşük sıcaklık stresine bitkilerin adaptasyonunu artırıcı etkide olduğu belirlenmiştir.

E.Ü. Ziraat Fakültesi Bahçe Bitkileri Bölümündeki iklim odasında oluşturulan kısa süreli (0°C'de 7 saat) düşük sıcaklık stresi altındaki Seyran F1 domates çeşidi domates fidelerine uygulanan TRUBIOL Bitki Antifriz etkilerinin araştırıldığı bu rapor 11 sayfa olarak tarafımdan hazırlanmıştır. Gereği bilgilerinize arz olunur. 02.01.2023

Prof. Dr. Hülya İLBI
E.Ü. Ziraat Fakültesi
Bahçe Bitkileri Bölümü

Eurofins Denmark Analysis

Alanine 0.456%

Glutamic Acid 3.37%

Lysine 0.157%

Serine 0.20%

Tryptophan 0.020%



Test	Parameter	Result	Unit	U(%)	Est. value
Amino-acids profile (with tryptophan)					
DI004	ISO 13903:2005 / IC-UV				
	Alanine	0.456	g/100 g	14	
	Arginine	0.0942	g/100 g	14	
	Aspartic acid	0.578	g/100 g	14	
	Glutamic acid	3.37	g/100 g	14	
	Glycine	0.337	g/100 g	14	
	Histidine	0.0576	g/100 g	14	
	# Hydroxyproline	<0.2 (LOQ)	g/100 g		
	Isoleucine	0.239	g/100 g	14	
	Leucine	0.272	g/100 g	14	
	Lysine	0.157	g/100 g	14	
	Ornithine	<0.05 (LOQ)	g/100 g		
	Phenylalanine	0.121	g/100 g	14	
	Proline	0.292	g/100 g	14	
	Serine	0.262	g/100 g	14	
	Threonine	0.164	g/100 g	14	
	Tyrosine	0.245	g/100 g	14	
	Valine	0.260	g/100 g	14	
DJ011	ISO 13903:2005 / IC-UV				
	Cysteine +Cystine	0.0330	g/100 g	14	
	Methionine	0.0310	g/100 g	14	
DJ009	EU 152/2009 / LC-FLD				
	Tryptophan (Total)	0.0362	g/100 g	10	



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Thank you!

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