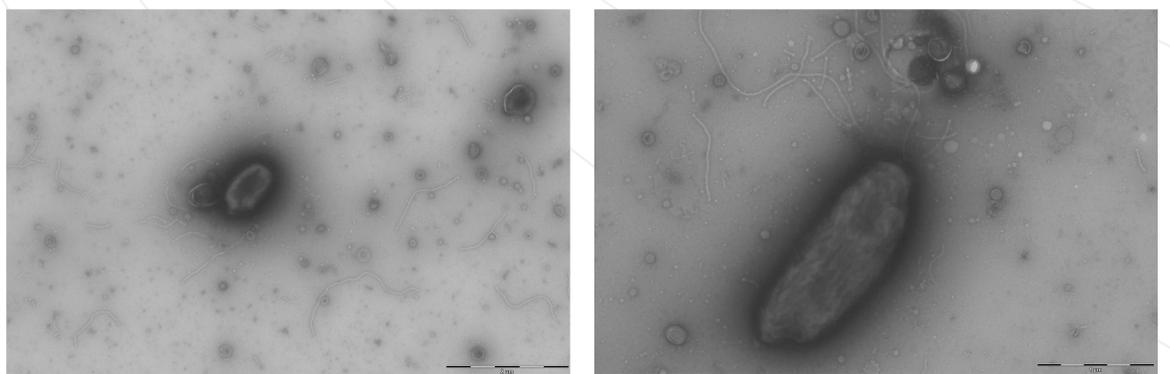


Variovorax pallaresianus, First sulphur-oxidizing bacterium of its genus with biostimulant activity

Introduction

Sulphur is an essential macronutrient, but its availability in soil is often limited. The biological oxidation of elemental sulphur to sulphate (SO₄²⁻) is key for plant uptake, improving nutrient use efficiency and correcting pH and salinity issues.

Until now, no strain of the genus *Variovorax* had been described with the ability to oxidize sulphur. **AFEPASA** has isolated, characterized, and patented the new species *Variovorax pallaresianus*, with strong sulphur-oxidizing activity and additional biostimulant mechanisms.



Morphological characteristics by transmission electron microscopy (20000x)

Results

Through biochemical and genetic analyses, it was confirmed that *Variovorax pallaresianus* has biostimulant capacities:

Cytokinin synthesis:

Promotes nutrient mobilization within the plant.

GABA synthesis:

Strong antioxidant effect that protects against temperature stress and water deficit.

ACC-deaminase synthesis:

Reduces ethylene levels under stress, preventing inhibition of root and foliar growth.

Sulphur oxidation:

Solubilizes elemental sulphur and improves nutrient availability.

Siderophore production:

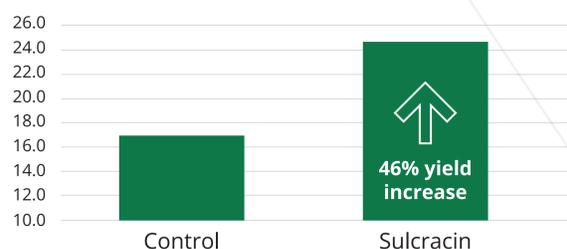
Captures iron in poor soils and makes it available to the plant.

Auxin (Indole-3-acetic acid) synthesis:

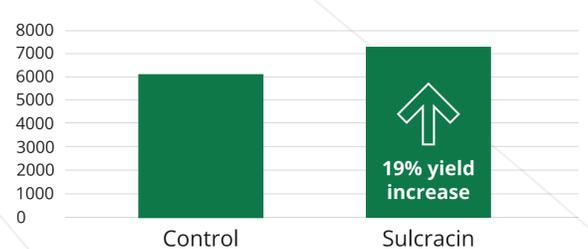
Promotes plant growth, lateral root formation, and the development of flowers and fruits.



Tomato, 2023 Alicante
N° tomatoes per plant



Onion, 2024 Sevilla
Yield (Kg/ha)



Conclusion

The newly patented species *Variovorax pallaresianus*, with its sulphur-oxidizing capacity, acts as a biostimulant in horticultural crops, increasing yields while enhancing soil health.



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