

Seeking an SME Partner in Tomato Production to Test a Bio-Based Soil Conditioner for Improving Yield and Mitigating Environmental Stress

Summary

Profile type

Research & Development Request Türkiye

Company's country

POD reference

RDRTR20260430011

Profile status

PUBLISHED

Type of partnership

Research and development cooperation agreement

Targeted countries

• **All countries**

Contact Person

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Term of validity

30 Apr 2026

30 Apr 2027

Last update

30 Apr 2026

General Information

Short summary

This project will develop a cellulose-derived hydrogel nanocomposite incorporating humic acid and carbon quantum dots to improve soil–plant interactions, tomato productivity, and resilience to environmental stress. Starting from TRL 1–2, the material will be designed and validated in the lab, then demonstrated at TRL 5 in open-field and greenhouse tomato trials with support from research partners, an agrochemical SME, tomato producers, and an agricultural institute.

Full description

This project aims to develop a bio-based, multifunctional soil–plant interface material that improves crop productivity, resource efficiency, and resilience to environmental stress. The proposed system is a cellulose-derived hydrogel nanocomposite incorporating humic acid and nitrogen-doped carbon quantum dots (CQDs). Together, these components form a hierarchically structured material with tunable physical, chemical, and biological properties. The project begins at TRL 1–2 with material design and laboratory validation and will progress to TRL 5 through greenhouse and open-field demonstration using tomato (*Solanum lycopersicum*) as the model crop.

Advantages and innovations

The core innovation is the integration of water retention, controlled nutrient release, environmental responsiveness, antimicrobial activity, and plant stress mitigation within a single biodegradable platform. The crosslinked cellulose matrix provides a porous hydrogel scaffold capable of retaining water, swelling in response to moisture conditions, and regulating nutrient availability. Humic acid functions as a bioactive filler that enhances ion exchange, improves soil-material interactions, and also serves as a renewable precursor for CQD synthesis. Nitrogen-doped CQDs, produced hydrothermally from humic acid and urea, are embedded in the hydrogel network to provide nanoscale bioactivity, including antimicrobial effects and modulation of plant oxidative stress responses.

Technical specification or expertise sought

An SME partner active in tomato production or agricultural input validation is sought to support pilot-scale testing of a bio-based soil conditioner under greenhouse or open-field conditions. The partner is expected to contribute to trial implementation, crop performance monitoring, and reporting of results. The collaboration will help demonstrate industry interest in bio-based soil conditioners as innovative solutions for improving crop resilience and mitigating abiotic and biotic stress.

Stage of development

Concept stage

IPR Status

No IPR applied

IPR Notes

Sustainable Development goals

• Goal 2: Zero Hunger

Partner Sought

Expected role of the partner

Partnership in M-Era-Net 2026 call for Topic 4.

Type of partnership

Research and development cooperation agreement

Type and size of the partner

- SME 11-49
- SME <=10
- SME 50 - 249

Call Details

Framework program

Eureka

Call title and identifier

M.Eranet 2026 call

Submission and evaluation scheme

Anticipated project budget

Coordinator required

No

Deadline for EoI

12 May 2026

Deadline of the call

12 May 2026

Project duration in weeks

Web link to the call

Project title and acronym

Dissemination

Technology keywords

- **07001007 - Precision agriculture**
- **07001010 - Micro- and Nanotechnology related to agriculture**
- **07001001 - Agriculture Machinery / Technology**

Targeted countries

- **All countries**

Market keywords

- **09005 - Agriculture, Forestry, Fishing, Animal Husbandry & Related Products**

Sector groups involved