

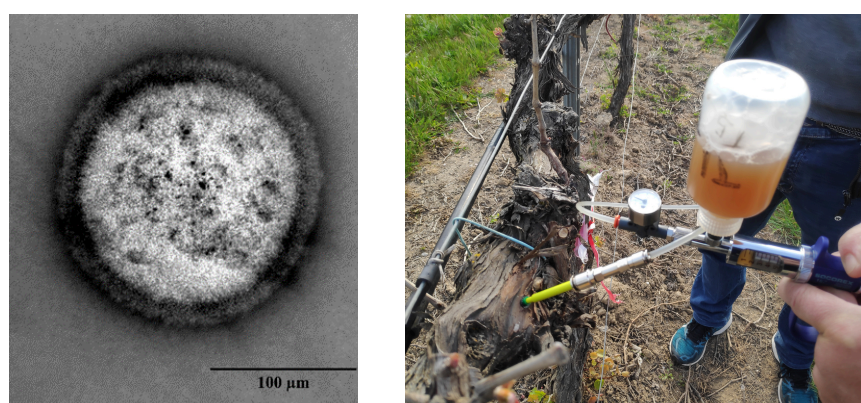
Why Use Nanocarriers (NCs)?

- Nanocarriers optimize crop performance while reducing the environmental footprint of food production and plant protection.
- Encapsulating active ingredients in NCs shields plants from the toxic effects of free agrochemicals, enhances absorption due to the improved penetration of nanometric particles through the plant cell wall and cuticle, and minimizes waste and leaching thanks to controlled release properties and the high bioavailability of nanoformulations.

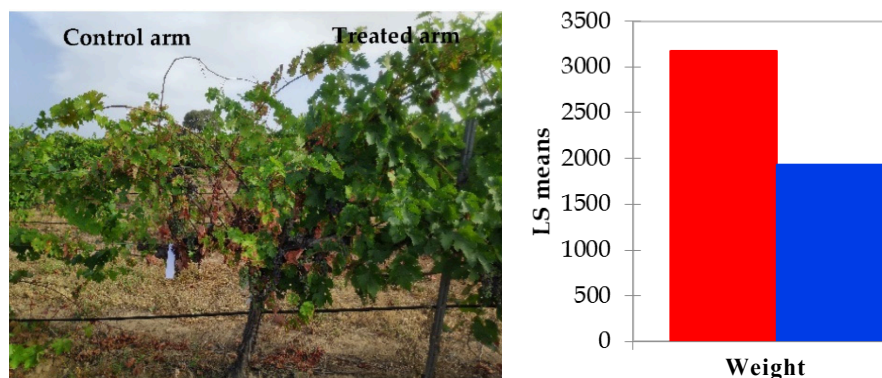
PREVIOUS RESULTS

Lignin-chitosan oligomers (COS) NCs

Patent ES2940132



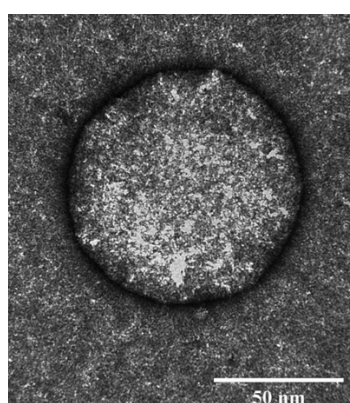
NCs loaded with *Rubia tinctorum* extract for endotherapy application against grapevine trunk diseases (GTDs).



Reduction of symptoms of grapevine trunk diseases, increased production, absence of phytotoxicity, no alteration of grape quality.

C₃N₄-COS NCs

Patent PCT/ES2023/070409



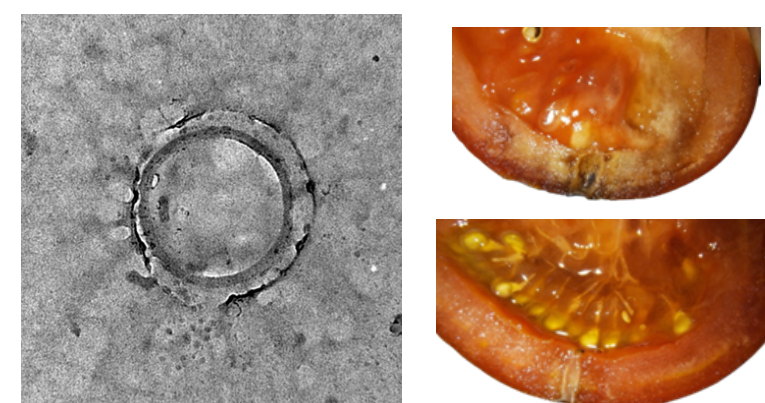
NCs loaded with *R. tinctorum* extract for GTD control in pruning wounds.



Treatment application at 250-750 ppm (left); necrosis lengths in control vs. treated plants (right).

COS-CMC-Alg NCs

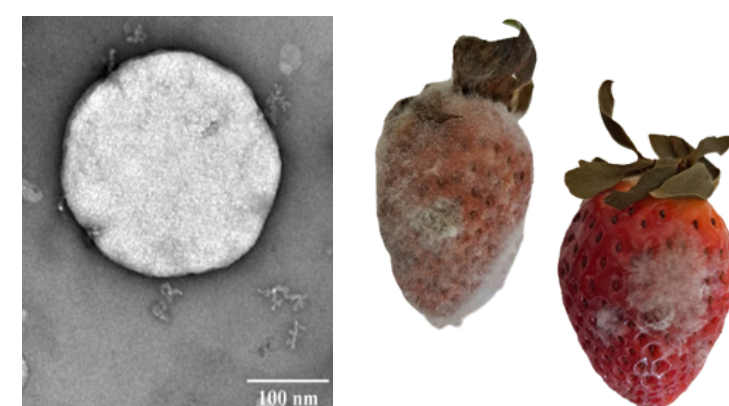
Patent application P202430024



Carvacrol-loaded NCs: high effectiveness for the control of *B. cinerea* in tomato at 100 ppm.

C₃N₄-COS-HAp NCs

Patent application P202330435



NCs loaded with *Uncaria tomentosa* extract: high effectiveness for the control of *B. cinerea* on strawberries at 500 ppm.



GONZÁLEZ BYASS

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SPRAY APPLICATION FOR THE CONTROL OF *B. CINEREA* BY SPRAYING



Effective protection against gray rot by C₃N₄-COS-R. *tinctorum* NCs (left) and C₃N₄-COS-HAp-U. *tomentosa* NCs (center) at 1500 ppm by spray-application on 'Tempranillo' grapes vs. the untreated control (right).