

Research Spotlight: Compatibility of Salibro™ Nematicide with Reklemel™ Active* with Naturally Present Biologicals

Salibro™

Reklemel™ active

NEMATICIDE



Paper examined: "Compatibility of fluazaindolizine with *Pasteuria penetrans* on spore attachment and infection of three *Meloidogyne* species," by Emmanuel A. Tzortzakakis, Eleni Nasiou, Anastasia Chatzaki and Tim C. Thoden, *Journal of Plant Diseases and Protection* (2023), 130:817–822.

New Research Shows Salibro™ Nematicide with Reklemel™ Active Works with Biologicals

Thanks to a new study, farmers can rest at ease when combining both a biological and a conventional tool to manage root-knot nematodes. In "Compatibility of fluazaindolizine with *Pasteuria penetrans* on spore attachment and infection of three *Meloidogyne* species," researchers from the Hellenic Agricultural Organization in Greece and Corteva Agriscience found that using Salibro™ nematicide with Reklemel™ active* to treat root-knot nematodes is safe to the beneficial bacterial nematode parasite *Pasteuria penetrans*. In fact, their research suggests that Salibro-exposed spores of *Pasteuria penetrans* showed even higher infectivity to root-knot nematodes.

What farmers need to know about root-knot nematodes

Not all nematodes are bad. "Eighty percent of the nematodes in the soil are beneficial," says Tim Thoden, Global Biology Leader in Nematicides at Corteva Agriscience and a co-author of this research. "They're either feeding on bacteria or on fungi, or they're hunting other soil organisms. It's only a relatively small fraction of those thousands of worms that you're going to have in a handful of soil that are parasitic to your roots." Root-knot nematodes are an example of nematodes that are parasitic. Once root-knot nematodes are in a field, it's hard to get rid of them if they are not being actively managed.

"They have hundreds or thousands of host plants, so it's not easy. You can switch from, let's say, a tomato to cucumber, but that's not going to help; you can switch to potato, but that's not going to help; you can switch to carrots—but these are all good host plants," Thoden says. "So it's extremely difficult, once you have them, to get rid of them."



Key Terms

Nematodes:

Microscopic, unsegmented worms that can feed on plants, bacteria, fungi, algae, insects and other small soil organisms. They are an important part of soil and sediment ecosystems.

Root-knot nematodes:

A type of plant-parasitic nematode from the genus *Meloidogyne*. They're known to produce impressive galls on plant roots and to modify plant metabolism. These pests have emerged globally and are robbing yield in many fruit and vegetable crops.

Pasteuria penetrans:

A bacterial parasite that helps stop root-knot nematodes from reproducing.

Salibro™ nematicide with Reklemel™ active:

A Corteva-developed nematicide with an innovative method of action to control root-knot nematodes; it was granted reduced-risk chemistry classification by the U.S. Environmental Protection Agency. Salibro is a novel mode of action for use in all root and tuber, fruiting vegetable and cucurbit crops grown in open-field and covered-crop situations. Salibro, like all of Corteva's products, has undergone rigorous testing worldwide and is in the process of being registered in multiple countries; it's already registered in the U.S.



What this study examined

Through a series of three experiments on sweet bell peppers (California Wonder) and tomatoes (ACE), this study investigated the attachment capability of *Pasteuria penetrans* spores treated with nematicides to second-stage juvenile nematodes (J2) of three major root-knot nematode species.



What the study found

Researchers concluded that the number of attached spores that had been incubated in Salibro™ nematicide with Reklemel™ active* before they were inoculated into J2s was the same as, or even higher than, that of untreated spores incubated in water. "Those spores, they're going to keep their aggressiveness," Thoden says.

Additionally, pre-exposure to Salibro did not impact the spores' ability to infect female nematodes and prevent them from laying eggs. Furthermore, the Salibro-treated spores produced new spores inside the infected female nematodes, which could attach to juvenile nematodes just like spores from untreated nematodes.

The paper concludes that Salibro is compatible with *Pasteuria penetrans* regarding spore attachment and infectivity, which means it can be successfully applied to plants for integrated root-knot nematode control.



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An Agronomist's Take



Agronomist David de Scals,

who works as a technical expert in biologicals at Corteva Agriscience, says this research is revolutionary. Just as farmers have seen integrated management of foliar pests evolve to become more targeted and less harmful to beneficial organisms, de Scals says this finding is the same—but now related to the soil.

"We have a new solution that controls plant-parasitic nematodes—those that hurt the plant like root-knot nematodes—but that respects free-living/beneficial nematodes that don't hurt the plant as well as other microorganisms and beneficials that increase the soil health," de Scals says.

De Scals' key takeaways:

- Farmers looking for sustainable soil management are already using different kinds of microorganisms on their crops.
- Having a tool like Salibro, which controls a pest as complicated as root-knot nematodes but is also gentle on other microorganisms, will be key in future production systems.
- Currently, there is nothing else like Salibro on the market.

De Scals is confident not only in this study's findings but also in the future of using Salibro for soil pest management. "I believe that it is a product that will be easily integrated into combined soil application programs with other microorganisms," de Scals says. In other words, not only with *Pasteuria* but also with *Bacillus*, *Lactobacillus*, *Pseudomonas*, *Trichoderma*, *Beauveria* and *Pochonia*.



Implications:

How can farmers apply these findings?

Salibro™ nematicide with Rekleme!™ active* can be used in integrated pest management for root-knot nematodes. Farmers can use Salibro nematicide to initially knock down nematode populations and combine that tactic with the use of beneficial organisms to help manage nematodes longer term. "You have naturally present *Pasteuria* populations in many soils, and applying Salibro into those soils is not causing a risk for these beneficial bacteria in the soil," Thoden says.

Salibro is very selective against plant-parasitic nematodes. It works in harmony with various beneficial organisms linked to pest and disease suppression, such as *Trichoderma*, *Purpureocillium* and *Beauveria* Fungi, and predatory nematodes. In addition, Salibro is safe for pollinators and other beneficial insects, letting farmers manage problem nematodes without harming organisms that help keep crops and soil healthy and productive.

Though this study focused on peppers and tomatoes, Thoden believes the findings are applicable to other fruits and vegetables. "If it is a root-knot nematode, it doesn't matter if you have a carrot, a tomato, a potato or a grape, as long as it is a plant that is a good host for your root-knot nematode," he says.



To bring this full circle

These research results emphasize the benefits of an integrated pest management approach. The study further supports that Salibro™ nematicide with Rekleme!™ active* can manage root-knot nematodes while facilitating the integration of beneficial organisms into a nematode management program. For example, it's safe to use with some antagonists that naturally exist in the soil, such as *Pasteuria penetrans*. In other words, Salibro manages pest nematodes without disrupting healthy soil ecosystems. Lastly, Thoden suggests that when combining Salibro with either naturally present soil beneficials or externally applied biocontrol organisms, it can safely enhance the effectiveness of root-knot nematode management.

