

A nematode gel to protect crops in Africa and Asia

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Application of the gel containing nematodes on maize plants using caulking gun-like devices. Credit: Patrick Fallet

The fall armyworm is a destructive corn pest that recently arrived in

Africa and Asia from the Americas and began causing major yield losses and increased use of insecticides, which pose environmental and human health risks.

Entomopathogenic nematodes are soil-dwelling roundworms that can parasitize and kill fall armyworms with no risks to people or the environment, but application can be tricky because the nematodes are susceptible to desiccation and UV radiation from sunlight.

Patrick Fallet and colleagues report success using an innocuous biodegradable gel made from carboxymethyl cellulose that protects nematodes and keeps them hydrated. The study is [published](#) in the journal *PNAS Nexus*.



Scientists evaluating the survival of fall armyworms on maize plants. Credit: Stefan Toepfer



Nemaotdes emerging from a fall armyworm caterpillar after infecting and killing it. Credit: Neil Villard

In [field trials](#) in Rwanda, the gel system, which was developed by the authors, outperformed a commercial liquid nematode formulation and the insecticide cypermethrin. When applied to the whorl of the corn plant three to four times throughout the season, the nematode gel decreased caterpillar infestation by about 50% and yielded an additional ton of maize (corn) per hectare.

Because the nematodes kill fall armyworms with the aid of evolutionarily nimble symbiotic bacteria, the armyworm is unlikely to develop resistance.

According to the authors, the nematode gel technology represents a promising alternative to chemical insecticides, with no deleterious effects on farmers, consumers, livestock, or the environment. The researchers say that selecting local strains of nematodes and developing caulking gun-like devices specifically designed for use by smallholder farmers could make the approach appealing and cost-effective.

More information: Patrick Fallet et al, Entomopathogenic nematodes as an effective and sustainable alternative to control the fall armyworm in Africa, *PNAS Nexus* (2024). [DOI: 10.1093/pnasnexus/pgae122](https://doi.org/10.1093/pnasnexus/pgae122)

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