

## K-State research team receives patent to control destructive parasite

November 9 2010

---

A recently patented invention from a Kansas State University research team aims to control a devastating parasite that causes millions of dollars in crop damage each year.

The invention, "Compositions and Methods for Controlling Plant Parasitic Nematodes," was developed by four K-State researchers: Harold Trick, professor of plant pathology; Timothy Todd, an instructor of [plant pathology](#); Michael Herman, associate professor of biology; and Judith Roe, former assistant professor of biology.

The researchers focused their work on the soybean cyst nematode, a destructive parasite that attacks the roots of [soybean plants](#). Farmers across the country lose nearly \$860 million every year because of the nematode. Kansas isn't exempt from the parasite: Todd said that every eastern and south central Kansas county that produces soybeans has soybean cyst nematodes.

"Trying to solve the problems with soybean cyst nematodes would be huge and very beneficial to U.S. farmers," Trick said. "Getting a handle on it is important."

Through [genetic engineering](#), the team engineered soybean plants with specific traits, so that when nematodes feed on the roots they ingest these traits that turn off specific nematode genes.

"What we did was target genes that we thought would be vital for the

nematode to survive," Trick said. "If we could turn these nematode genes off, we essentially can kill the nematode and provide the plant with protection."

For the patent, the research targeted three genes: MSP, or Major Sperm Protein, which causes nematode sperm to move; Chitin synthase, the gene that helps form the eggshell on nematode offspring; and RNA Polymerase II, which is vital for RNA production.

By controlling these three genes, researchers were able to halt the reproduction of the nematodes and saw a 68 to 70 percent reduction in the presence of soybean cyst nematode. The team was also careful to prevent any negative off-target effects, or ways that the altered genes could negatively affect the soybeans or animals and humans who ingest the soybeans.

While the patent is very valuable for soybean production, it has also opened the way for further beneficial research. Since the work on the patent, Trick and Todd have continued similar research on 20 different kinds of gene sequences in other plant and nematode species. They are taking the same method of destroying the [soybean cyst nematode](#) and applying it to nematodes that affect plants such as wheat, tomatoes and pineapples.

Trick and Todd have been supported in their research by funding from the Kansas Soybean Commission and the United Soybean Board. They are in the process of filing for additional patents for some of their inventions.

"With this technology -- it may not be the genes under the patent, and it may be other genes that we find or someone else finds -- we're hoping to produce plants with durable resistance to parasitic nematodes," Trick said.

The patent is the eighth patent that K-State has received this year. It was issued earlier this year to the Kansas State University Research Foundation, or KSURF. The foundation is a nonprofit corporation responsible for managing the technology transfer activities of the university.

The research foundation is working with the National Institute for Strategic Technology Acquisition and Commercialization, known as NISTAC, to license the patent, said Marcia Molina, foundation vice president. NISTAC is involved with the expansion of technology-based, high growth enterprises and helps with the commercialization of intellectual property from K-State researchers.

Provided by Kansas State University

Citation: K-State research team receives patent to control destructive parasite (2010, November 9) retrieved 28 June 2024 from <https://phys.org/news/2010-11-k-state-team-patent-destructive-parasite.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.