USDA Grant Expands UNH Research on Managing Parasitic Roundworms

cientists Investigating How to Control Crop-Damaging Nematodes

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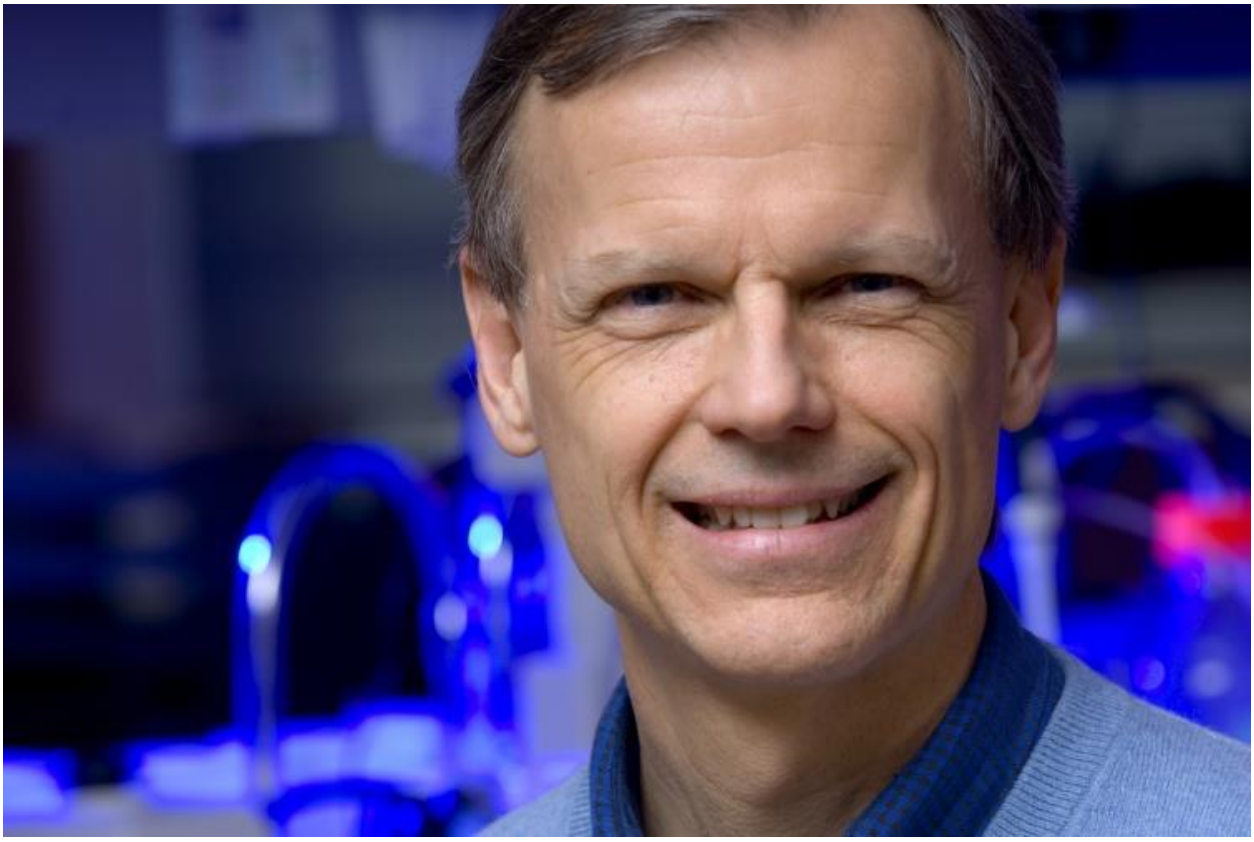

NH AGRICULTURAL EXPERIMENT STATION RESEARCHER RICK COTE AT THE UNIVERSITY OF NEW HAMPSHIRE HAS RECEIVED A USDA GRANT TO EXPAND HIS RESEARCH ON ROUNDWORMS, WHICH CAUSE APPROXIMATELY $100 BILLION IN ANNUAL GLOBAL CROP DAMAGE.

NH Agricultural Experiment Station researcher Rick Cote at the University of New Hampshire has received a USDA grant to expand his research on parasitic nematodes, or roundworms, which cause approximately $100 billion in annual global crop damage. Researchers are hopeful that one day their work will lead to the development of next generation nematicides, or chemical pesticides that will provide farmers with a new way to safely manage these agricultural pests.

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Five years ago, the NH Agricultural Experiment Station funded Cote's research project to investigate the physiological role of phosphodiesterase enzymes, or PDEs, in roundworms. As a result, Cote and his research team developed a new way of disrupting the motility and reproduction of these plant parasitic nematodes. Based on this research, UNH recently filed a patent stating that the phosphodiesterase enzyme (PDE) is a promising target to combat roundworm infestations in agricultural crops such as corn, cotton, wheat, soybean, rice, and potato.

This experiment station support also allowed doctoral student Kevin Schuster to carry out experiments showing that when nematodes are treated with various commercially available PDE inhibitors, their ability to move or sense their surroundings is disrupted.

In addition, a research collaboration with Valerie Williamson, professor of entomology at UC Davis, has shown that root-knot nematodes, in particular, when treated with PDE inhibitors, are unable to infect plant roots. Cote and his team are particularly interested in root-knot nematodes. These parasitic roundworms can infect about 2,000 species of plants and are one of the most damaging groups of parasitic roundworms to agricultural crops worldwide.

According to Schuster, these results support the idea that PDE inhibitors could be used as nematicides to kill plant parasitic nematodes. Cote's recent USDA NIFA SEED award for approximately $150,000 allows his team to expand its research in developing new nematicides that precisely target plant parasitic nematodes without adverse effects on the agricultural ecosystem: farmers, crops, and wildlife.

"Our research team is well positioned to identify which PDEs are the best targets for pharmacological disruption of the nematode lifecycle. We also hope to identify lead compounds that represent the starting point for the synthesis of selective nematicides targeting plant parasitic nematodes," said Cote, professor and chair of the Department of Molecular, Cellular, and Biomedical Sciences.

Founded in 1887, the NH Agricultural Experiment Station at the UNH College of Life Sciences and Agriculture is UNH's original research center and an elemental component of New Hampshire's land-grant university heritage and mission. We steward federal and state funding, including support from the USDA National Institute of Food and Agriculture, to provide unbiased and objective research concerning diverse aspects of sustainable agriculture and foods, aquaculture, forest management, and related

wildlife, natural resources and rural community topics. We maintain the Woodman and Kingman agronomy and horticultural farms, the Macfarlane Greenhouses, the Fairchild Dairy Teaching and Research Center, and the Organic Dairy Research Farm. Additional properties also provide forage, forests and woodlands in direct support to research, teaching, and outreach. Sign up to receive our research news in your in-box.

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