



News from Northern New York Agricultural Development Program

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Cornell University Research Support Specialist Edward Thomas checks alfalfa plants for brown root rot in early greenhouse work to breed BRR-resistant varieties. Photo: Cornell University

NNY Research Advancing Battle vs. Brown Root Rot

In 2013, a Cornell University research team funded by the farmer-driven Northern New York Agricultural Development Program (NNYADP) is taking a proactive approach to brown root rot (BRR), a fungus that damages alfalfa crops. The disease was first discovered in the eastern U.S. in Northern New York in 2004 at Chazy.

Research leader Dr. Julie L. Hansen, with the Cornell University Department of Plant Breeding and Genetics, says, "We have begun breeding BRR-resistant alfalfa to identify the most commercially-viable varieties under Northern New York field conditions."

Hansen; Cornell plant breeder Dr. Donald Viands, and research support specialist Jamie Crawford are using cuttings of plants that survived significant 2011-2012 winter ice-sheeting and BRR at the Miner Institute in Chazy to breed a genetic capacity for BRR resistance into future generations of alfalfa.

"Based on data from western Canada where brown root rot has long been a problem for alfalfa producers, the breeding of BRR-resistant alfalfa varieties can help Northern New York growers stem stand losses and regain yield and profitability," Hansen says.

BRR, primarily active in winter and early spring, is associated with slow emergence, alfalfa stand decline, and yield loss.

Field trials with BRR-resistant alfalfa varieties in Saskatchewan showed 23-65 percent higher yields over BRR-susceptible varieties. New York-specific development of BRR-resistant varieties is needed because the BRR-resistant Peace alfalfa grown in western Canada does not grow well in New York.

Because BRR can persist in soil year-round and has a broad range of host plants, crop rotation is not a successful strategy for farmers to cope with BRR.

NNYADP-funded foundational research by Cornell Plant Pathologist Gary Bergstrom and then-graduate student Michael Wunsch produced the initial understanding of how the soil-borne fungus that causes root and crown rot of alfalfa, other perennial legumes, and overwintering grasses impacts crops in Northern New York.

“We know brown root rot is endemic to Northern New York and is a factor that impacts the longevity of alfalfa crops,” Bergstrom says. “The field trials at Miner Institute and the Cornell Willsboro Research Farm lead us to believe that while BRR is not an economically-significant pathogen of perennial forage grasses, the grasses serve as a host and reservoir that hold the fungus in the area.”

Seed from the 2013 generation of BRR-resistance breeding will be planted in NNY field trials next spring. Researchers are looking for yield results that will show scientifically-sound predictors or commercial value.

The NNYADP project is expected to involve multiple years of breeding successively-stronger generations of BRR-resistant alfalfa.

“This early research funded by the Northern New York Agricultural Development Program is establishing a benchmark to assist farmers with variety selection management strategies for coping with brown root rot,” Bergstrom says.

Wunsch, now a plant pathologist with North Dakota State University, is using the Northern New York foundation of his thesis research to improve techniques for the molecular detection of BRR.

To learn more about brown root rot research, visit the Northern New York Agricultural Development Program website at www.nnyagdev.org. The farmer-driven Northern New York Agricultural Development Program funds research, technical assistance and outreach for agricultural producers in Clinton, Essex, Franklin, Jefferson, Lewis and St. Lawrence counties. -30-