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Certain cover crop greatly reduces population of soybean cyst nematode

by Farm and Dairy Staff

COLUMBUS — The benefits of cover crops continue to grow. Touted for conserving soil while filling forage needs, some plant varieties also have the potential to suppress soybean cyst nematode populations in no-till fields.

Ohio State University researchers in the Department of Horticulture and Crop Science have found that Italian ryegrass (also known as annual ryegrass), when planted as a fall cover crop, reduces soybean cyst nematode egg populations 30-50 percent in a single growing season.

Weed populations

Additionally, researchers discovered that Italian ryegrass reduces weed populations by as much as 50 percent, including purple deadnettle, which is a prolific overwintering host for soybean cyst nematode.

Kent Harrison, a weed ecologist with the university's Ohio Agricultural Research and Development Center, said the findings offer an additional tool for managing soybean cyst nematode, a small round worm that can cause significant yield reductions in soybeans.

Soybean cyst nematode is the No. 2 soybean pest in Ohio, behind Phytophthora root rot.

"A rotation with nonhost crops still works as the best tool for managing soybean cyst nematode populations. We are not advocating growing cover crops as a substitute for annual crop rotations in pest management," said Harrison.

Another tool

"We see this work as just providing another tool for managing the pest with something that has multiple uses, benefits the soil, as well as acting as a short-term grazing crop. Italian ryegrass can do all of these."

Harrison and his colleagues conducted the work over a five-year period at the Ohio Agricultural Research and Development Center's Waterman Farm in Columbus, Ohio, inoculating a small no-till plot with soybean cyst nematode and then planting half the field with Italian ryegrass and leaving the other half untouched.

Harrison said the fieldwork was inspired by lab work conducted in Canada that found certain cover crops, such as perennial ryegrass and white clover, suppressed soybean cyst nematode populations. Italian ryegrass produced the strongest results.



Premature hatching

"It is possible that the presence of Italian ryegrass causes soybean cyst nematode eggs to hatch prematurely, in the fall rather than in the spring, depleting egg numbers and killing off populations because they have no winter host to feed on," said Harrison.

"The ryegrass grows quickly, produces a massive root system and harbors beneficial organisms that eat weed seeds, so it just out-competes other weeds in a no-till field, including purple deadnettle."

Harrison and his colleagues haven't figured out yet why some soybean cyst nematode eggs hatch prematurely, but they speculate it might be chemically driven.

"Soybean cyst nematodes hatch in the presence of purple deadnettle. There's got to be some chemical signaling involved that says a host is present, and it's possible that Italian ryegrass is mimicking this chemical signal," said Harrison.

"Other cereal grasses do this, as well, but to a lesser extent."

Most effective

Harrison said Italian ryegrass works most effectively when it is planted in the fall before soybean cyst nematode completes its first life cycle on purple deadnettle, usually in September or October.

Like most other cover crops, Italian ryegrass must be burned down in the spring before crops are planted. Though a beneficial crop in the fall and winter, come spring and summer it can become a nuisance weed if allowed to go to seed.

Researchers are expanding their work on the effects of fall cover crops on soybean cyst nematode populations to cereal rye, oats and wheat.



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