

PEST

MGMT

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Cover Crops Shown to Suppress Soybean Diseases

BY DARIN EASTBURN

Farmers plant cover crops for a number of reasons including preventing soil erosion and increasing soil organic matter. Now there may be one more reason — suppressing plant diseases.

In a study funded by a grant from North Central SARE (Sustainable Agriculture Research and Education), Illinois researchers who also participate in the Sustainable Corn Project investigated the effects that cover crops have on soybean diseases. They found significantly lower levels of disease in soybean crops growing in soils previously planted to a cover crop than in crops planted in fallow soils.

One of the cover crops studied was cereal rye which was integrated into a standard corn/soybean rotation, with the cover crop planted after corn harvest, usually in late September. The cover crop was then killed and/or incorporated into the soil the follow-

ing spring, several weeks before planting a soybean crop.

The effects the cover crop had on soybean diseases were somewhat variable, with the biggest effects seen when disease potential was high. In 2011 and 2013, in plots intentionally infested with the *Rhizoctonia* root rot fungus, soybean stand counts were significantly higher in plots previously planted with a rye cover

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crop, as compared to plots which had not had a cover crop. In addition, lesions of *Rhizoctonia* root rot were measured on three-week-old seedlings. Measurements consistently showed lower

disease levels on plants growing in the rye. Greenhouse tests on soil taken from cover crop plots also showed that, for some years and locations, the soils sampled from the rye were more suppressive to *Rhizoctonia* root rot than was the soil from the fallow plots.

Other measurements of root and foliar diseases showed mixed effects of the cover crops. Lower levels of sudden death syndrome (SDS) were observed in rye plot soils in some years and locations, but the effect was not consistent. In one location, the severity levels of *Septoria* brown spot were much lower on soybeans growing in the rye cover crop plots when compared to those growing in the previously fallow plots. In addition, egg counts of soybean cyst nematodes were consistently lower in soils taken from rye plots when compared to levels in fallow plot soils at multiple locations, supporting the findings of a preliminary study that showed lower levels of soybean cyst following a rye cover crop.

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^ A healthy soybean root (left) compared to roots infected by *Rhizoctonia solani* (right). Photo by Alison Robertson.



^ Early *Rhizoctonia* symptoms. Infected seedlings have reddish-brown lesions on the hypocotyls at the soil line. Photo by Daren Mueller.



^ Sudden death syndrome (SDS) of soybean produces foliar symptoms appearing as yellowing and death of tissue between leaf veins. Photo by Daren Mueller.