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Economic effects of cover crops in corn–soybean rotation

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Dr. Shalamar Armstrong inspecting early growth of a cereal rye and daikon radish cover crop mixture interseeded into maize. Photo courtesy of Richard Roth.

Despite growing interest in cover crops in recent years, implementation remains sparse among Midwest corn and soybean producers. Soil health and environmental benefits of the cover crop system are well established. However, producers commonly identify economic return (or lack thereof) as an impediment to adoption.

In an article soon to be published in *Agronomy Journal*, researchers used four years of rotation corn and soybean data from central Illinois to quantify the direct short-run net returns to the producer from adopting cover crops. The unique field experiment tracked each phase of the cover crop system, allowing for the calibration of a comprehensive economic simulation.

Results indicate that direct short-run net returns to the producer were routinely negative, even when considering current cost-share payments. Returns to the soybean phase of the rotation were higher than corn given that the cover crop significantly reduced corn yield in one of two years but did not significantly affect soybean yield.

Each plot in the field experiment was also individually tile drained, allowing the team to link estimated net returns with reductions in total annual nitrate load. The breakeven analysis estimated that subsidy values would have to exceed what is currently available through programs such as EQIP in order for the producer to break even.

In the short-run, incentivizing producers to adopt cover crops will likely require (i) improved recommendations for cover crop best management practices to eliminate current downside risk and (ii) higher cost-share payments or established markets to internalize cover crop benefits that accrue to society.

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Thompson, N. M., Armstrong, S. D., Roth, R. T., Ruffatti, M. D., & Reeling, C. J. (2020). Short-run net returns to a cereal rye cover crop mix in a Midwest corn–soybean rotation. *Agronomy Journal*, *112*. **https://doi.org/10.1002/agj2.20132**

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