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Managing the Economics of Planting Cereal Rye as a Cover Crop

Gary Schnitkey, Krista Swanson and Jonathan Coppess

Department of Agricultural and Consumer Economics
University of Illinois

Shalamar Armstrong

Department of Agronomy
Purdue University

August 14, 2018

farmdoc daily (8): 151

Recommended citation format: Schnitkey, G., K. Swanson, J. Coppess and S. Armstrong. "Managing the Economics of Planting Cereal Rye as a Cover Crop." *farmdoc daily* (8): 151, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, August 14, 2018.

Permalink: <https://farmdocdaily.illinois.edu/2018/08/managing-economics-planting-cereal-rye-cover-crop.html>

Many farmers begin experimenting with cover crops by planting cereal rye into corn stalks with the following crop being soybeans (see [NREC Guide](#) for more detail). This article discusses some of the economic implications of adopting this practice. The establishment costs and environmental benefits associated with cover crops are relatively easy to identify (see *farmdoc daily*, [June 28, 2019](#) for a discussion of budget implications). Coming up with cost reductions or yield increases to offset establishment costs in the first year are more difficult. Experimenting with cover crops has long-term implications. Because there likely are long-term soil health benefits to cover crop adoption, planting cover crops on land in which the farmer has long-term control seems prudent.

Establishment Costs

Seed and application costs are the major costs associated with establishing cereal rye in corn. Seed costs will equal a price per pound of seed times the seeding rate per acre. For 2018, a reasonable estimate of cereal rye price is \$.29 per pound. Recommendations from the Illinois Nutrient Research & Education Council (NREC) suggest [seeding rates over 50 pounds per acre](#). Many farmers use lower rates. A seeding rate of 30 pounds per acre would result in seed costs of \$8.70 per acre. A 60 pound seeding rate would double that cost to \$17.40 per acre.

Application methods range from aerial application into standing corn, planting with a drill following harvest, broadcast seeding with a light tillage operation performed after seeding, or simple broadcast application. A broadcast seeding with light application would likely cost around \$10 per acre. Other application methods could result in significantly higher costs.

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An estimate of costs with a 30 pound rate, broadcast seeding with light working is around \$18.70 per acre. Costs will increase from this \$18.70 level with higher seeding rates and different methods of seed application.

Benefits from Cover Crops

Several continuing studies show that use of cereal rye reduces nitrogen entering into drainage tile ([Roth, et.al.](#)), suggesting that use of cereal rye will consequently reduce nitrogen effluent entering streams, rivers, lakes, and eventually oceans. Nitrogen runoff reductions have societal benefits related to maintaining safe drinking water supplies, enhancing aquatic environments, and reducing nitrogen effluent into the Gulf of Mexico.

Research also shows that continual use of cover crops has soil health benefits including a gradual increase in soil organic matter. An increase in organic matter likely will improve nutrient and water holding capabilities of the soil, which could have yield enhancing benefits, particularly in drought years. Many long-term practitioners of cover crops indicate that there are many other benefits. While there are good, plausible reasons to believe in these future benefits, few side-by-side comparisons of use and non use of cover crops are available in the public sector.

An important feature of both of these benefits is that they will not generate a financial return to farmers in the year in which soybean are planted. Sequestering nitrogen will not reduce fertilizer costs or necessarily increase soybean yields in the first year. Benefits from soil health will occur in the future after several years of planting cover crops. As a result, other ways of mitigating establishment costs are needed.

Costs and Yields

Ways of mitigating establishment costs include reducing other costs or increasing yields. For many farms, the elimination of tillage passes may offset establishment costs. Take, for example, a situation in which a farmer performs two tillage passes during the transition from corn stalks to soybeans. If these tillage passes are eliminated and soybeans are planted no-till into the cover crop, the cost of those tillage passes will not be incurred. These two tillage passes would have a cost of more than \$20 per acre. Saving \$20 per acre may offset establishment costs and any changes in the costs of the herbicide program.

Yields can vary with and without cover crops. A recent study of cover crops suggest that cover crops have little to no negative impact on yields, with some soybean yields increasing as the result of cover crops (<https://www.extension.iastate.edu/news/nine-year-study-reports-improved-yields-following-cereal-rye>). For the first year of cover crop use, building a budget with the same yield between use and non-use of cover crops seems reasonable.

The Decision and Choice of Farmland

Obviously, profitability concerns for 2019 are a major consideration when deciding to adopt cover crops. Despite the initial cost and associated reduction in returns, experimenting with cover crops has strategic, long-term implications. Long-term benefits may accrue from cover crops. Moreover, some practices like cover crops may become part of regulated nutrient management plans in the future.

The long-term benefits associated with cover crops are more likely to occur with continual use. Since these are long-term benefits, farmers must maintain control of farmland to receive those benefits. Planting cover crops on owned farmland seems the prudent choice. Discussion should occur between farmers and landowners when cover crops are used on rented farmland. Share rent farmland may be good candidate for cover crops, particularly if the landowner is willing to share in establishment costs and the landowner and farmer have a long-term relationship. Cash rented farmland has more problems. Likely the farmer would have to bear all the establishment costs and maintain control of the farmland for many years to receive benefits. These problems become larger for "High" cash rent farmland with a good chance of turnover. Short-term leases and long-term benefits are hard to match. Communication between the landlord and tenant is important in finding an effective solution that works for both parties. Under any rental arrangement, land owners at least need to share in costs before use of cover crops seems warranted on rented farmland.

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