

# Cover crops revisited

In the category of “what’s old is new again,” we recently read a SARE (Sustainable Agricultural Research & Education) Technical Bulletin on cover crops (<https://tinyurl.com/y3mvqhoe>). While some farms have used cover crops as a part of their crop rotation since at least the 1930s, the widespread use of synthetic nitrogen following WWII reduced the use of cover crops. This was compounded by the increase in the number of farms that abandoned raising animals altogether to focus on crop production.

In recent decades and with the support of programs like SARE as well as the increase in organic crop and animal production, cover crops have begun to make a comeback. The most recent Census of Agriculture revealed that “cover crop acreage increased 50 percent nationally from 2012 to 2017.” In “Cover Crop Economics: Opportunities to Improve Your Bottom Line,” SARE authors Rob Myers, Alan Weber, and Sami Tellatin “describe seven specific situations in which the profitability of cover crops can be accelerated:”

- Herbicide-resistant weeds are a problem;
- Cover crops are grazed;
- Soil compaction is an issue;
- Cover crops are used to speed up and ease the transition to no-till;
- Soil moisture is at a deficit or irrigation is needed;
- Fertilizer costs are high, or manure nutrients need to be sequestered; and
- Incentive payments are received for using cover crops.

While not all farmers in the 2016-2017 National Cover Crop Survey saw the same benefits from adding cover crops to their production practices, most experienced multiple benefits.

One of the most dramatic benefits came about as the result of the 2012 drought. Corn farmers saw a 9.6 percent increase in corn yields following cover crops versus comparably managed fields with no cover crops. Soybean farmers saw an 11.6 percent increase. While some farmers saw no increase, others saw greater increases than these.

In an analysis of the 2015 and 2016 crop years, the longer the period of time farmers have been using cover crops, the greater the yield increase. In the first year, corn farmers saw a 0.52 percent yield increase while in the fifth year the increase was 3 percent. For soybeans the comparable numbers are 2.12 percent and 4.96 percent.

One of the factors that plays into the annual yield increases and the resilience in 2012 is the increase in water infiltration into the soil. The root systems of the cover crops penetrate the soil to a greater depth than those of corn and soybeans, resulting in a loosening of the soil through “the macropores created by those deeper roots [that] help get air and water deeper” into the soil profile.

This increase in water infiltration into the soil reduces runoff and allows farmers to get into their fields more quickly after a rain than they otherwise would expect. For the 2019 spring planting, it will be interesting to see the comparison of fields where cover crops have been used for multiple years to similarly situated fields with no recent cover crop history.

Other benefits to farmers identified in the bulletin include the prevention of soil erosion; the control of weeds, particularly those that are herbicide resistant; reduced herbicide and fertilizer costs; the increase of organic matter in the soil; a reduction in soil compaction; and an increase in pollinators and beneficial insects.

Societal/off-farm benefits include an improvement in water quality (“a median reduction of 48 percent in nitrogen leaching from fields”), reduced sediment load in waterways resulting in cleaner water and lower dredging costs, capturing carbon that would otherwise remain in the atmosphere, and an increase in biodiversity. The use of cover crops also results in increased consumer acceptability as the consequence of fields that are “being managed in a more sustainable fashion.

*Policy Pennings Column 982*

*Originally published in MidAmerica Farmer Grower, Vol. 37, No. 228, June 28, 2019*

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