

# Cover Crops Earn their Keep Combating Herbicide-Resistant Weeds

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## **Bulletin Overview**

The potential benefits of cover crops are well-documented and well advertised. When weighed against the concrete costs of cover crops (i.e. seed, planting, termination), however, it can be easy to lose sight of the value of those potential benefits.

A recent [SARE](#) Ag Innovations Technical Bulletin (*Cover Crop Economics: Opportunities to Improve Your Bottom Line in Row Crops*) explores the economics of cover crops and makes a persuasive case for their use, particularly in cropping systems struggling with herbicide-resistant weeds.

Cover crops in any given year may seem to incur more costs than benefits, but over the long term they provide a net benefit by improving farm resiliency and efficiency. It can take at least three years before the benefits of cover crops to begin outweigh the costs in the absence of incentive payments or unique situations and cover crop uses.

However, there are situations and uses that can speed up the rate at which you see a positive net return on cover crop use. These situations and tactics include when incentive payments for cover crop use are available, when fertilizer costs are high or there is a need to manage nutrients in applied manure, when soil moisture is lacking, when you are transitioning to no-till, when soil compaction is a problem, when grazing the cover crop, and ***when herbicide-resistant weeds are present.***

How unique are these cover crop uses and field conditions, really? Many cropping systems experience more than one at the same time! For example, some states, such as Maryland, have extensive incentive programs in place. The [NRCS EQIP](#) basic cover crop rate ranges from \$17 per acre in North Dakota to \$54 in Pennsylvania. Farmers can take advantage of incentive programs while simultaneously combating compaction and herbicide-resistant weeds.

## **A Word About the Data Analysis**

The economic analyses in this SARE Technical Bulletin are based on self-reported numbers from the [CTIC Annual Cover Crop Survey](#). Self-reported numbers are based on the memories of survey respondents (and thus potentially less sound). However, the CTIC Annual Cover Crop Survey is the largest survey of its kind, giving bulletin authors a large data set from which to make calculations (thus decreasing the risk of bias in the numbers).

## **Drilling Down: The Specifics of How (and How Much) Cover Crop Use Pays**

Bulletin authors estimate that after one year of cover cropping in corn or soybeans, **there was a benefit of \$0-\$15 per acre in weed control costs; after five years of cover cropping, savings increased to \$10-\$25 per acre.** These estimates are based on the assumption that there was a decrease in the number of herbicide passes needed or cheaper herbicides were used. They also assume the cover crops have produced sufficient biomass to suppress weeds.

YEARS OF COVER CROP	Savings (\$/A)
1	0-15
5	10-25

Table 1: Weed control benefits after 1 or 5 years of cover cropping in soybeans or corn. Source: [SARE Ag Innovations Technical Bulletin \(Cover Crop Economics: Opportunities to Improve Your Bottom Line in Row Crops\)](#)

These same assumptions, along with an estimated decreased penalty from weed seed contamination of harvested grain, drive their estimates of net return on cover crops when “severe” infestations of herbicide-resistant weeds are present. The adjusted net returns on cover crops in corn in the presence of herbicide-resistant weeds after one, three, and five years of cover cropping are, respectively, roughly -\$4, \$28, and \$45 per acre. In soybeans the adjusted net return in the presence of herbicide-resistant weeds after one, three, and five years of cover cropping are roughly \$3, \$27, and \$37 per acre, respectively.

	YEARS OF CONTINUOUS COVER CROPS (\$/A)		
Cash Crop	1	3	5
CORN	-4	28	45
SOYBEANS	3	27	37

Table 2: Cover crop net returns in different cash crops in presence of herbicide-resistant weeds after 1, 3 and 5 years of cover cropping . Source: [SARE Ag Innovations Technical Bulletin \(Cover Crop Economics: Opportunities to Improve Your Bottom Line in Row Crops\)](#)

**Cover crops to combat herbicide-resistant weeds put you back in the black faster in soybeans than corn**, perhaps because corn is more competitive against weeds than soybeans so it takes a few more years for benefits to accrue. Cover crops decrease the ability of weeds to compete with the cash crop, which protects cash crop yield. Cover crops suppress weed growth, decreasing the amount of weed seed available both to contaminate the cash crop seed and to go back into the soil seedbank for germination next year (and in future seasons).

## **Get the Most Out of Your Cover Crop**

For optimum cover crop suppression of weeds, optimize cover crop biomass production. Choose a cover crop that will do well in your area. Cereal rye is the universal default choice in the US because of its high biomass and cold tolerance. Plant the cover crop at the optimum time and terminate it as late in the spring as you reasonably can, or consider planting green. For more information on cover crop selection and management, [see](#). For more information on planting green, [see](#).

It is worth noting that there are ways to minimize the costs of cover crops and maximize the benefits of cover crops.

- Choose the cover crop species with the lowest seed cost that will meet your goals and thrive under your field conditions. Don't pick a five-way species mix if cereal rye will meet your needs.
- Choose a cover crop that can do double duty - for example, a species such as cereal rye that both breaks up soil compaction and takes up nutrients from manure.
- "Double up" - if you apply fertilizer in the fall, seed cover crops at the same time as you apply the fertilizer to cut down on the cost of cover crop planting. Use your spring burndown application (prior to corn or soybean planting) to terminate the cover crop along with any weeds.
- Manage the cover crop to meet your goals. If your goal is weed suppression, maximize cover crop biomass as discussed elsewhere in this article.

Consider, too, the less tangible benefits of cover crops. Landowners are becoming increasingly savvy about land stewardship; your use of cover crops may give you an edge in the land rental market. Cover crop use has a very real impact beyond the farm gate on public resources such as lakes and bays.

## **Takeaways**

- You will get the best "returns" from using cover crops if you use cover crops in tandem with other sustainable practices such as reduced tillage, much like IWM calls for the use of multiple weed control tactics to manage weeds successfully.
- Like IWM tactics, it takes several years of cover crop use to accrue benefits - look at the long run, rather than the short run.
- Resiliency, one of the key benefits of cover crops, may only be apparent in a truly difficult year, such as a drought year.
- To see for yourself how your cover crop experiences compare with bulletin estimates and calculations, see *Cover Crop Economics: Opportunities to Improve Your Bottom Line in Row Crops*

## Bibliography

[SARE](#) Cover crops economics

[Environmental Quality Incentives Program-NRCS](#)

[CTIC Annual Cover Crop Survey](#).