



COVER CROPS

COVER CROPS BUILD SOIL HEALTH AND TAKE UP NITROGEN LEFT OVER AT THE END OF THE GROWING SEASON. They also add diversity to your crop rotation, keep your soil covered over the winter and help to maintain living roots in the soil. Cover crop management strategies should be tailored for your farm to support your goals and objectives.

WHAT SHOULD I EXPECT?

Performance that lines up with your goals and desired benefits- Individual cover crop species and mixes offer a variety of benefits for your operation, from improved nutrient cycling to weed suppression.

Improved soil health- By increasing diversity in your cropping system, keeping the soil covered and maintaining living roots in the soil, you're helping to feed the soil ecosystem through the winter. Cover crops also help to increase organic matter, which helps to retain water and nutrients in the soil profile.

Managing your cover crops like your cash crops- Your soil is a valuable asset. Investing time to plan and implement a cover crop management strategy will pay dividends to the economic and environmental sustainability of your farm.

WHAT ARE THE BENEFITS?

The following table shows how different cover crop species offer a variety of benefits depending on the needs of each of your fields. Cover crop management is also an important part of the equation. For example, planting early encourages increased cover crop growth and nitrogen uptake in the fall, while later termination supports higher biomass and weed suppression.

Mixed species cover crops can increase management complexity, but also offer multiple benefits compared to the use of a single species. Careful management helps to maximize benefits and ensure that cover crops don't interfere with early growth and development of the following crop.

	Grasses including Cereal Rye, Wheat and Barley	Brassicas including Radish, Mustard and Rape	Legumes including Vetch and Clovers
Take up nitrogen	X	X	
Reduce erosion	X	X	X
Reduce compaction		X	
Suppress weeds	X	X	
Add nitrogen			X
Add biomass and build soil organic matter/ carbon	X	X	X

COVER CROPS IN ACTION

Cover crop management strategies involve a broad range of components, including species or mixes, seeding rates, and timing and methods of establishment and termination. **Cover crop research in the Mid-Atlantic region has been conducted for more than three decades**, and the body of research on the impacts of these different management strategies continues to grow. Research highlights include:

- Queenstown, MD- **Cereal Rye reduced nitrate loss to groundwater by 80%** when planted after no-till corn harvest (Staver & Brinsfield, 1998).
- Salisbury, MD- **Hairy vetch (a legume) fixed about 2 lb N/acre/day** from April 10 to May 5, resulting in an additional 60 lb N/A in aboveground biomass that becomes available to the next crop. (Clark, et. Al., 1995)
- Beltsville, MD- A mixed species cover crop took up an intermediate amount of nitrogen compared to a pure stand of rye or hairy vetch. Similarly, the mixed-species stand re-released nitrogen back into the soil more slowly than hairy vetch but faster than a stand of pure rye. (Poffenbarger, Mirsky, et. Al., 2015)
- Two sites in MD- **Forage Radish can take up 100 – 150 lb of N if planted in August or early September**. Radish usually winter-kills and decomposes rapidly, which may reduce the need for fertilizer, but also makes N vulnerable to leaching early in the season. (Dean & Weil, 2009) Combining radish with another winter-hardy species will ensure that a cover crop is present into the spring.



The Delaware Cover Crop Network demonstrates the impact of cover crop establishment timing. These plots of rye and hairy vetch were planted in Georgetown, DE on September 21 (left), October 20 (middle) and November 16, 2017 (right). The photos were taken the following March. **Earlier establishment helps the cover take up and store more N from the soil.**

NRCS PRACTICES

ENVIRONMENTAL QUALITY INCENTIVE PROGRAM (EQIP) PRACTICES:

- Cover Crop (340)

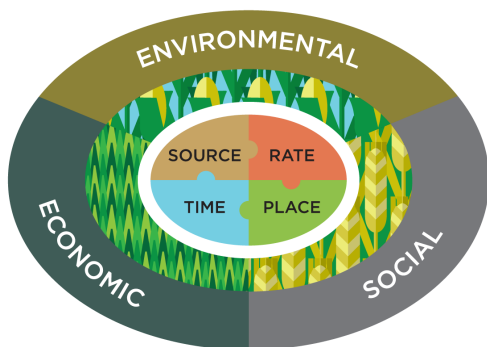
CONSERVATION STEWARDSHIP PROGRAM (CSP) ENHANCEMENTS:

- E340134Z- Cover crops to suppress excessive weed pressures and break pest cycles
- E340118Z Cover crop to reduce water quality degradation by utilizing excess soil nutrients – surface water
- E340107Z- Cover crop to minimize soil compaction
- E340106Z4- Use of soil health assessment to assist with development of cover crop mix to improve soil health and increase soil organic matter

- E340106Z2- Use of multi-species cover crop to improve soil health and increase soil organic matter
- E340102Z- Cover crop to reduce wind erosion
- E340101Z- Cover crop to reduce water erosion
- E328134R- Resource Conserving Crop Rotation
- E340119Z- Cover crop to reduce water quality degradation by utilizing excess soil nutrients-ground water excess soil nutrients-ground water

FURTHER READING

- **MANAGING COVER CROPS PROFITABLY**– SARE Publication, Available at sare.org
- **NRCS COVER CROPS AND SOIL HEALTH WEBSITE**– Available at: tinyurl.com/nrcscovercrops



THE DELAWARE MARYLAND 4R ALLIANCE (DM4RA) is a collaboration between agribusinesses, government agencies, conservation groups and scientists working together to ensure that every nutrient application on Delmarva is consistent with the 4Rs– the Right Nutrient Source, applied at the Right Rate, at the Right Time, in the Right Place.

Founded by The Nature Conservancy and the Delaware-Maryland Agribusiness Association, we support the increased implementation of 4R practices, to benefit the economic, environmental and social well-being of our region and our farmers.

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