

# AGRONOMIC Spotlight



## Cover Crops

- A variety of cover crops can be used to meet the needs of a grower's operation.
- Management considerations such as planting method and harvest timing and method should be considered for each cover crop species.
- The fit of a cover crop in cash crop rotation and government support should be researched before selecting cover crop species.

## Benefits of Planting Cover Crops

Various cover crops bring different attributes to a farming operation. The potential benefits of cover crops combined with how they fit into a cropping rotation are the first items to consider when evaluating the use of cover crops.

**Nitrogen (N) Source.** Legumes, such as hairy vetch and crimson clover, have the ability to supply N for the cash crop grown after them.<sup>2</sup> Legumes convert N gas from the air into N that is plant available. Crops grown in fields following legumes can utilize 30 to 60 percent of the N that the legume produced, depending on the legume, its growth stage, and if tillage is used.<sup>1,2</sup>

**Nitrogen Scavenger.** Cover crops that are N scavengers can help reduce the amount of N available for leaching into ground water. N scavengers can take up and store excess N, which can be released at a time closer to when the cash crop can utilize it. Deep-rooted cover crops can scavenge N that is deep in the soil profile and bring it to the surface. Non-legumes with fibrous root systems, such as cereal rye, various brassica species, and oats are often good N scavengers.

**Soil Builder.** Soil structure can be improved as a result of the additional organic matter produced by cover crops. In the Cover Crops Decision Tool (CCDT), the soil building characteristic is defined as the ability of a crop to produce organic matter and improve soil structure. This characteristic assumes the cover crop will be regularly involved in the crop rotation. If no-till practices are utilized, cereal rye can be a good soil builder due to its abundant residue which contributes to organic matter and helps conserve soil moisture. Sorghum sudangrass can add carbon in no-till situations; however, tillage negates any carbon addition.<sup>2</sup> Radishes have deep penetrating roots to help break up compaction, thereby aiding soil health.

**Erosion Fighter.** Cover crops can help reduce erosion in several ways. Extensive and quickly developing root systems can help improve water

infiltration and reduce runoff and erosion. Quick above-ground growth of various cover crop species can help prevent soil erosion caused by rain drops hitting bare soil (Figure 1).

**Weed Fighter.** Cover crops can compete with weeds for light, nutrients, and moisture. A good stand of cover crops or their residue can block light from reaching the soil surface. As a smother crop, cover crops can suppress persistent weeds by competing for water and nutrients.

**Good Grazing.** Several of the common cover crops can be utilized for grazing. Cover crops can be especially valuable where they continue to grow and provide grazing land into the early winter. Some of the potential nutrient benefits for the cash crop could be diminished where cash crops follow grazed cover crops.

**Rapid Growth.** Weed control and reduction of soil erosion are aided by quick growth of cover crops. Post-harvest is a great time to start a quick-growing cover crop. Soil benefits can still be realized before a killing frost.

**Lasting Residue.** When cover crops have long lasting residue, they are more likely to help provide weed control and retain soil moisture. The timing of when the cover crop is killed greatly influences the rate of residue degradation. Generally, if a cover crop, such as cereal rye, is killed in the vegetative stage the residue decomposes fairly quickly, often in approximately 30



Figure 1. Quick growth of fall-planted barley can help hold soil and nutrients on the field in the case of excess rainfall.

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days. If killed closer to maturity, the residue can be much longer lasting.<sup>2</sup>

**Interseed with Cash Crop or Other Cover Crop.** Certain species of cover crops can make good companion crops. For example, oats can aid in the establishment and overwintering of slow growing fall-seeded legumes.<sup>2</sup> Cover crops should be evaluated as a companion crop considering pest and agronomic factors that could affect growth of cash crops.

## Planting/Seeding Cover Crops

Many cover crops (single and mixtures) should be seeded in the late summer or early fall for the most reliable establishment. Very early spring-seeding (dormant) is an option for cover crops such as spring oats and annual ryegrass. Frost-seeding is an option for a few cover crops such as spring oats, annual ryegrass, red clover, and sweet clover. Frost-seeding is when the seed is spread onto ground that has been 'honeycombed' by the freeze and thaw cycles. The seed drops into the cracks and germinates as the temperatures warm up in the spring.<sup>1</sup> Individual cover crops should be evaluated for 'freeze risk to establishment' with the Cover Crop Decision Tool (CCDT) found at the Midwest Cover Crop Council (MCCC) website ([www.mccc.msu.edu](http://www.mccc.msu.edu)). The CCDT can also be used to determine seeding rates, seeding depth, and feasibility of interseeding with existing crop.

## Removal of Cover Crop

**Removal Methods.** Cover crop species differ in their ability to survive winter conditions. For those that survive the winter, removal can often be accomplished with an application of a non-selective herbicide, and/or through tillage. Herbicides are often the preferred removal method compared to tillage, as tillage can decrease some of the benefits of the cover crop. Always read and follow label directions. It is important to make sure the application timing and rates are compatible with your weed management plan and the cash crop to be planted next.

**Timing.** Different cover crops should be removed at different times. This will help maximize benefits while minimizing potentially negative effects the cover crop can have on the cash crop that is to be planted. To help manage the seed bank, the cover crop should generally be removed prior to it setting seed. For more details about terminating a cover crop, please contact your local Extension agent, agronomist, or cover crop seed provider.

## Other Issues to Consider

Some states have programs including conservation with cover crops and demonstrations of cover crop use through the local offices of the Natural Resources Conservation Service. As for crop insurance, if cover crops will be planted, regardless if they are grazed, baled, or otherwise, it is important to contact a crop insurance provider to obtain the rules and regulations that deal with insuring a cash crop such as corn or soybeans when a cover crop is closely involved in the rotation.



Figure 2. Oilseed radish planted in the fall (photo taken after a mild frost).

## Resources

The MCCC has a wealth of information regarding several aspects of cover crops, including the CCDT, which can help identify cover crop choices for an operation and provide agronomic recommendations for establishment. Understanding the agronomics of cover crops can help increase the utility of the benefits the CCDT has to offer.

Please contact the local Extension agent, agronomist, or cover crop seed provider for more detailed information.

### Sources:

- <sup>1</sup> Clark, Andy. 2007. Managing cover crops profitably. 3rd edition. Sustainable Agricultural Network, Beltsville, MD, Handbook Series 9. <http://www.mccc.msu.edu> (verified 10/29/2013)  
<sup>2</sup> Plumer, M. 2012. Dec. Personal Communication. Southern Illinois Round Table Discussion.

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For additional agronomic information, please contact your local seed representative.

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