

## Empty Fields Are Wasted Fields

### *The benefits and challenges of cover crops*

In recent years, cover crops have become an increasingly popular way for growers to address a variety of problems, from erosion, to compaction, to poor root health, to increasing fertilizer and fuel costs. Effective use of cover crops, however, involves more than scattering seeds on an empty field—cover crops must be planted with deliberation. Whether you practice conventional or conservation tillage, cover crops, if used correctly, can be successfully incorporated into your residue management system.

### **The benefits of cover crops**

So why are cover crops, as the Father of Cover Crops Steve Groff says, “the trend of the future”? Research has demonstrated numerous opportunities for soil health improvement, pollution prevention, and cost savings. One of the most obvious advantages is the prevention of soil erosion—crop cover when soil would usually be bare holds soil in place, reduces crusting, and protects against erosion from wind and rain. There are numerous other benefits:

**Soil health** – The advantages brought by cover crops do not always manifest immediately. One benefit that increases over time is cover crops’ contribution to soil health. “Cover crops add organic matter to the soil and that has many wonderful benefits,” says Nancy Creamer, assistant professor of horticultural science at North Carolina State University in Raleigh, N.C. “Organic matter improves the physical condition of the soil by improving soil tilth, stability of soil aggregates, water infiltration, air diffusion, and by reducing soil crusting.”<sup>ii</sup> Keep in mind, though, that while cover crops normally increase organic matter, this can be negated by aggressively tilling the soil.



*Cover crops are a growing trend with numerous benefits.*

Cover crops can also help relieve soil compaction. Crops like tillage radish, with deep, penetrating roots, can break up compacted soil. The taproot creates deep channels in the subsoil during the fall when the soil is wet and soft. During the following summer, those channels provide a route for the cash crop roots to follow down to the moisture and nutrients. Studies have shown that this leads to higher yields.<sup>ii</sup>

**Fertilizer** – One of the most notable benefits of certain cover crops is their ability to add nitrogen (N) to the soil. “Green manure” cover crops—often high-N legumes—can supplement or replace chemical

fertilizers and therefore reduce fertilizer costs. A crop like corn planted in the field after a cover crop of legumes can use from 30 to 60 percent of the N that the legume produced.<sup>iii</sup>

**Soil moisture and temperature** – Cover crops can help manage soil moisture in either too wet or too dry conditions. When the weather is too dry, cover crop residue helps trap surface water and add organic matter to increase infiltration to the root zone. Grass-type cover crops such as rye, wheat, and sorghum-sudangrass hybrids are especially effective.

In too-wet conditions, keep cover crops alive longer to draw excess water from the soil.

**Pest prevention** – A thick cover crop can often out-compete weeds, preventing weeds' germination and reproduction. Even if weeds manage to germinate, the "cover crop smother effect" can come into play—the cover crop can prevent weeds from building up enough energy to grow and emerge from the cover crop mulch layer. Some crops can even help reduce populations of bacterial and fungal diseases and combat parasitic nematodes.

## Getting started

With such a wide range of benefits, it should come as no surprise there is no one species of cover crop that offers all of them. One of the first questions that farmers considering cover crops must answer, then, is what benefits they are most interested in. The range of benefits can be increased by increasing the diversity of cover crops grown, the frequency of use between cash crops, and the length of time that cover crops are growing in the field. Try mixing two or more species, or try several options in small areas.

Choosing the correct cover crop is a complex process during which detailed resources should be consulted. Some options are:

- *Managing Cover Crops Profitably*<sup>iv</sup>
- The Cover Crop Decision Tool from the Midwest Cover Crops Council. The current version has been completed for Indiana, Michigan, Minnesota, Ohio, and Wisconsin.

The best time to plant cover crops also varies with every field. A good place to start is by making a chart of your current crop rotation, adding in other key information such as rainfall, frost-free



*The first step to choosing a cover crop is to identify what benefits serve you best.*

### Benefits by cover crop in the Midwest Corn Belt

- **Provide nitrogen:** hairy vetch, red clover, berseem clover, crimson clover
- **Build soil:** rye, barley, sorghum-sudangrass hybrid, sweet clover
- **Reduce soil erosion:** wheat clover, rye, ryegrass, barley
- **Provide weed control:** rye, ryegrass, wheat, buckwheat, oats
- **Fight pests:** rye, sorghum-sudangrass hybrid
- **Reduce Compaction:** tillage radish

periods, and times of heavy labor or equipment demand. Then look for openings, making sure you plan to plant early enough to allow good root establishment and top growth.

Cover crop termination must be planned with equal care, because it can affect the soil temperature, soil moisture, nutrient cycling, and tillage and planting operations. Typically, cover crops should be terminated two to three weeks before planting the cash crop so that the plants can dry out and become brittle. Dry cover crop residue is easier for tillage and planting equipment to cut through.

### Seeding methods

To reap the benefits, cover crops must be successfully established, and that relies on good seeding methods. There are several methods that can be employed.<sup>v</sup>

- **Drilling:** Drilling is a good option for almost any cover crop. It is the most reliable method, because it achieves good seed-to-soil contact. Conservation tillage drills can handle residue and provide uniform seeding depth and adequate seed-to-soil contact, even with small seeded cover crops. The cost of maintaining and operating a drill, however, can be high for some farmers. Also, seeding must occur after harvest, so timing could limit the choices for cover crops.
- **Broadcast seeding and incorporation:** A less reliable method is broadcasting the seed and then incorporating it. This requires an increase in the seeding rate compared to other methods. This method tends to work better with small-seeded species such as clovers. It must also take place after harvest, limiting the time window.
- **Surface broadcast:** This is a great option for farmers who would like to try cover crops during the growing season. A highboy seeder can accurately deliver seed between rows during the while the cash crop is in the field.
- **Aerial seeding:** On larger fields, consider aerial seeding by fixed-wing aircraft or helicopter. This outsourced job can also be a good option for farmers short on labor.
- **Air seeding:** An effective but expensive option, air seeding precisely places single or multiple cover crops and ensures good germination. This option must take place after harvest.

### Cover crop challenges

Before adding cover crops to their planting schedule, there are pitfalls that farmers should be wary of. If not managed properly, cover crops can actually lead to complications with the cash crop. To prevent the possible negative effects, make sure to research cover crop types and methods carefully. In addition, follow these tips:



*Residue managers are essential for planting into cover crops. Shown here is an example of what can occur when Yetter SharkTooth® Residue Managers are not set aggressively enough.*

- When planting your cash crop, make sure good seed-to-soil contact and seed placement are being achieved. Pay special attention to seeding depth. Spoked closing wheels like the 6200 Cast Spike Closing Wheels or Paddle Wheels from Yetter Farm Equipment crumble the seed trench closed for adequate seed-to-soil contact, but leave the soil loose enough for plant emergence.
- Be sure that coulters are cutting through cover crop residue rather than pushing it into the soil along with the seed. Row cleaners like the patented Yetter 2967 SharkTooth® Wheel can help. Its backward-sloping teeth are designed to sweep residue away from the opening disks of the planter units, row cleaners reduce the chance of pushing residue into the seed furrow (hairpinning). All row cleaners can be adjusted to match specific field conditions.
- Terminate the cover crop at least 2 to 3 weeks before planting the cash crop.
- To prevent pests, check the crop for early season insect problems such as cutworms.

### **Weigh the benefits**

So, are cover crops right for your fields? Just like any other crop, you should weigh the costs and benefits of a cover crop carefully before proceeding. With the multitude of potential benefits, however, growers are increasingly finding that cover crops just make sense.

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<sup>i</sup> Colleen Scherer, "Make Money With Cover Crops,"

<<http://www.cedarmeadowfarm.com/PublishedArticles/NewsArticles/News09.html>>, accessed on February 9, 2012.

<sup>ii</sup> *Tillage Radish*, <<http://tillageradish.com/benefits/reduced-compaction.php>>, accessed on February 20, 2012.

<sup>iii</sup> Andy Clark, ed., *Managing Cover Crops Profitably*, Sustainable Agriculture Network, 2007, pg. 9.

<sup>iv</sup> *Ibid.*, pg. 66.

<sup>v</sup> Martha Mintz, "Getting Cover Crops off the Starting Block," *No-Till Farmer*, February 2012, pg. 41.

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