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Cover crops 101: Tips and tricks for getting started

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Cover crops are frequently being promoted for the impact they have on reducing nutrient and sediment losses as well as improving soil health. There is no doubt that this is the case. Research across the United States has repeatedly proven these benefits. As a result, interest in cover crop use has risen dramatically over the last decade. However, such interest has not lead to widespread adoption of cover crops in Iowa. In 2015 it was estimated that approximately 500,000 acres of cover crops were planted in Iowa. That's less than a half percent of the row-crop acres. Poor establishment, spring termination, impact on yield, and timing of seeding and termination are frequently cited as reasons cover crops are not adopted. Yet farmer champions can be found across the state that have adopted and excelled in using cover crops. Here are some best management practices that should be considered for beginning cover crop users.

Species selection

Start with something that is inexpensive, simple, and matches up with your needs for timing and method of seeding as well as desired termination plans. For the most part this means using a cereal grain as a cover crop. Winter cereal grains, such as cereal rye and wheat, require spring termination ahead of cash crop planting. Spring cereal grains, such as oats, will winterkill negating the need for spring termination. Generally cereal grains are easy to establish with good fall growth and rapid spring growth. Brassicas, legumes, and other grasses produce less biomass compared with cereal grains resulting in lower chance getting desired benefits.

Timing and method of seeding

Early vegetative, late vegetative, or after harvest are the three broad categories for timing of seeding. At this time it is advised to avoid early vegetative seeding due to minimal research available and higher potential risk for detrimental effect on cash crops.

Late vegetative seeding has the option of high clearance seeders or aerial applicators. Both have become widely available, however, seed to soil contact is not ideal and even distribution can be problematic. Additionally, late vegetative establishment is greatly affected by the availability of soil moisture, rainfall, and light penetration through the canopy. When establishment is good, late vegetative seeding provides more growing season for biomass production before a killing frost occurs and, therefore, larger soil health and environmental benefits compared to post-harvest cover crop seeding. Drawbacks with late vegetative seeding include the need to increase seeding rates, less reliable stand establishment, and fewer species options compared to seeding with a grain drill.

Post-harvest cover crop seeding has more options for seeding method such as broadcast seeding followed with shallow tillage or using a grain drill. However, the recommended post-harvest seeding method is by grain drill because of superior seed-to-soil contact and uniform stand establishment. Because of superior seed-to-soil contact with grain drills most cover crop species can be considered if the timing of planting is adequate for establishment and growth before a fall frost occurs. A major limitation of post-harvest seeding is a reduced timeframe available from cash crop harvest to fall freeze, especially following a full season corn crop.

Cover crop termination

Termination of winter-hardy cover crops in the spring needs to be considered at the onset of the decision to implement cover crops. The timing of termination is critical ahead of corn planting and less critical ahead of soybean planting. First and foremost, read and follow herbicide label instructions. Translocated or non-selective contact herbicides will effectively terminate most cover crops. Glyphosate is often the herbicide of choice. Whether glyphosate or other herbicides are used, make sure applications are made when the cover crop is actively growing. This will be when daytime temperatures are above 60 degrees F and nighttime temperature are above 40 degrees F. Herbicide termination will be more effective before cereal grains are 10 to 12 inches tall.

Roller crimpers and tillage are alternative options for termination of cover crops. Use of roller crimpers can be more challenging due to varied growth stages of the species. Effective kill from roller crimpers can be achieved for cereal grains after milk stage has occurred whereas hairy vetch must be in full bloom. Tillage as a termination strategy can be challenging, especially if soil conditions are moist and the cover crop has developed a large root mass. Termination by tillage often requires multiple tillage passes followed by dry conditions. If rainfall occurs too soon after tillage, the cover crop may reestablish.

Cash crop planter setting

Planting corn or soybean following a cover crop is not business as usual. Even farmers who have been no-till for a long time indicate planter settings must be adjusted. The same criteria need to be met whether planting into cover crop residue, high-residue, or low-residue situations. Focus on attaining optimal seed depth, make sure the seed furrow remains closed, and reduce risk of compaction from too much row unit down pressure and sidewall smearing. This sounds easy and straight forward, however, often times planting into cover crop residue fails for these reasons. Sidewall compaction occurs because cover crop residues reduce soil water evaporation, increasing the time needed for soil drying before planting after spring rains. Shallow and variable seed depth is due to lack of row unit down pressure while too much down pressure creates a compacted zone beneath the depth gauge wheels potentially resulting in poor root development. Seed furrows reopen as a result of not enough pressure on the closing wheel. Taking the time to check soil conditions and planter setting at the onset of planting will increase cash crop establishment following cover crops.

Corn and soybean management

Management following cover crops requires changes also. Tillage becomes less desirable unless strip tillage is being used. Nutrient applications would best be moved to spring pre-plant or split applications. Adjustments or modifications may be needed to ensure planter units don't cause sidewall compaction or leave the furrow open. Pay special attention to planting depth, planter row unit down pressure, and closing wheel force and effectiveness. There is some evidence that starter fertilizer, increasing corn seeding rates by 10%, and leaving a cover crop-free strip where next year's corn row will be planted can reduce problems for the corn crop.

Consider how soil residual herbicides used in the spring and summer may affect cover crop germination, emergence, and growth in the fall. Pay attention to insects that may benefit from spring 'green-bridge' growth such as black cutworms and armyworms. Watch for seedling root diseases and use fungicide seed treatments especially when cover crops and cash crops are closely related.

In summary, successful implementation of cover crops will take additional thought and management. Cover crop adoption is more than just planting and terminating the cover crop. Start small; this reduces the risk and minimizes the additional time required for cover crop implementation. Like adopting any new, expect a learning curve and do your homework ahead of implementation.

Look for “easy” entry points. In the first years of using cover crops find situations, rotations, fields, or programs that make them easier to use by giving you extra time to work with, providing obvious benefits, or reducing risks and costs. Farming operations that are “easy” entry points include livestock operations that can utilize the cover crop for grazing or haylage; operations that include seed corn or silage production that can establish cover crops more timely; and following early maturing crops such as soybean, winter wheat, and oats.

Useful resources

Iowa Cover Crop Resource Guide:

<https://store.extension.iastate.edu/Product/Iowa-Cover-Crop-Resource-Guide>

Midwest Cover Crop Field Guide:

<https://store.extension.iastate.edu/Product/Midwest-Cover-Crops-Field-Guide-2nd-Edition>

Successful Cover Crop Termination with Herbicides, Purdue University:

<https://www.extension.purdue.edu/extmedia/ws/ws-50-w.pdf>

Iowa Learning Farms:

<http://www.iowalearningfarms.org/cover-crops>

Midwest Cover Crops Council:

<http://www.mccc.msu.edu/selectorINTRO.html>

Practical Farmers of Iowa:

<http://www.practicalfarmers.org/member-priorities/cover-crops>