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EXPERT REVIEWED

MANAGING COVER CROPS

Cover Crops for Prevented Planting Acres

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Excessive spring rainfall and prolonged ponding conditions often mean some fields remain unplanted to corn or soybeans. These "prevented planting" acres, while unfortunate for the current year's production, should be managed to prevent further soil degradation and increase soil productivity for next year.

Producers should consider cover crops, which are an excellent option for protecting soil and increasing productive capacity for succeeding years. This publication briefly describes the benefits of growing cover crops on prevented planting acres and provides guidance for selecting and seeding cover crops on these acres.

Producers should check with their Farm Services Agency (FSA) and crop insurance agents about harvest or grazing restrictions for cover crops.

Prolonged and excessive rainfall and ponding can break down soil aggregates, especially near the soil surface. Flooding and erosion remove valuable topsoil and all the nutrients, organic matter, and soil organisms it contains. And when these fields finally dry out, the soil surface becomes hard and crusted and is prone to further erosion by water or wind. If producers till these areas to control weeds and leave the soil bare, soil organic matter declines and nutrients can be lost through leaching, even on fields not subject to water erosion.

To rebuild lost productive capacity and improve soil health, it is essential to grow a cover crop for the remainder of the season. In fact, it is important to have something green and growing whenever the ground is not frozen. Keeping growing plants in the ground improves soil health, decreases nitrate leaching to drainage waters, and improves water quality.

Cover Crop Benefits

Cover crops provide many benefits in various cropping systems. The three most significant benefits in prevented planting acres are described below.

Improve Soil Structure and Biological Activity in Topsoil

Planting cover crops on prevented planting acres protects the soil from further water and wind erosion. Just as important, high-biomass cover crops help build soil organic matter, improve soil aggregation, and stimulate soil biological activity by adding their roots and shoots to the soil.

Fibrous roots enmesh soil particles and provide food for microorganisms, which in turn produce polysaccharides and other "sticky" substances that stabilize soil aggregates. Cover crops also provide food for beneficial soil fauna such as earthworms.

Cover crop roots and the soil biological activity they promote also increase soil porosity and decrease density near the soil surface, which improve infiltration into the soil. Both the root growth and top growth of the cover crops will contribute to building soil organic matter faster than if the soil is left bare or left to weeds.

Increase Permeability and Decrease Compaction

Deep-rooted cover crops can penetrate compacted layers and provide deep, continuous channels for water percolation and root penetration in subsequent cash crops. Planting these taprooted crops in prevented planting acres can often provide greater benefits than planting them in a normal rotation. That's because the cover crop will have a longer time to grow than if you were to plant them after a typical soybean or corn harvest.

If fields are so compacted that they require deep tillage or subsoiling, planting a deep-rooted cover crop after tilling will help stabilize the improvements in permeability, rebuild soil structure, and stimulate soil biological activity along root channels.

Build Soil Nitrogen

Cover crops can build soil nitrogen by fixing atmospheric N (legumes) or by trapping residual soil N to prevent it from leaching into drainage waters. A legume or legume mix planted in early summer may provide more than half of the required N for next year's corn crop. Brassicas or grasses can trap or scavenge more than 40 pounds of residual N from the soil originating from fertilizer or soil organic matter mineralization and even larger amounts where manure was recently applied. This protects water quality, and some of the scavenged N will be available to succeeding cash crops while the rest helps build soil organic matter.

Getting Started With Cover Crops

Before you plant cover crops on prevented planting (or any) acres, it is important to consider which crops you will plant and how you will seed them.

Select the Optimal Cover Crop

When selecting which cover crops to plant, always remember the main purposes of the cover crops for your situation.

Grasses usually provide the greatest amount of biomass both below and above ground and will build soil organic matter most quickly. Summer grasses (such as sorghum-sudangrass and millets) are good choices for early summer plantings, while the more familiar cereal grains and annual ryegrass can be planted mid- to late summer.

Legumes fix atmospheric nitrogen that can be used by next year's cash crop. Cowpeas are an excellent legume choice for midsummer plantings. Hairy vetch, crimson clover, and winter peas can be planted through late summer. *Don't forget that you have to inoculate all legume seed.*

Brassicas (such as daikon radish, turnip, rapeseed, and canola) have taproots that help break up tillage pans and improve permeability. They also are excellent nitrogen scavengers and can be planted mid- to late summer. Note that if you plant daikon radish too early (before August), the plant can bolt and produce seed or produce tubers that are larger than desired.

Always plant daikon radish in a mixture with a grass. This helps reduce the N losses during the radish's rapid decomposition after a freeze and helps maintain some surface residue cover after the radish decomposition.

Often, a mix of cover crops provides more benefits than a single species, and producers should consider a mix that includes two or three of the plant classes discussed above. These species mixes stimulate soil biological activity more quickly because there is greater diversity of crop and root types. Mixing a fibrous-rooted grass and a legume or brassica with a taproot will improve soil throughout the soil profile.

There are several tools to help producers select cover crops for their situation in Indiana. The Midwest Cover Crops Council (mccc.msu.edu) has a selector tool that was built starting with Indiana conditions and experience. Enter your state and county, and you will see a chart of various cover crops and their planting date windows. You can further narrow the list by inputting up to three desired purposes for the covers (such as N scavenger or soil builder), and then select from that list. The chart includes a few common mixes.

The Indiana NRCS Cover Crops Seeding Tool (see Resources, page 3) also provides guidance about cover crop species and allows more flexibility in determining mixes. With prevented planting acres you obviously have many more cover crop choices than you do when you seed covers after a corn or soybean harvest.

It's also important to consider whether you want the cover crop to overwinter or to winter-kill. The advantage of winter-kill covers is that you do not need to terminate them in spring; however, covers that overwinter will continue to provide some additional growth and benefit next spring.

You may need to manage some summer-planted cover crops by mowing or killing them before they form seed heads so they don't become a weed problem the next year. If you applied residual herbicides this year, consult herbicide labels for plant back restrictions — some covers are sensitive to certain residual herbicides. You should also check with your crop insurance agents and FSA to understand any harvest or grazing restrictions related to cover crops on prevented planting acres.

Seed Cover Crops Properly

For prevented planting conditions, it is best to seed the cover crop with a drill or planter to assure good soil-seed contact. This is especially important given that crusted, hard topsoil is common after prolonged soil ponding.

Conclusions

Cover crops can be an excellent management tool to improve soil productivity under any conditions but especially on prevented planting acres. If you've had a difficult spring, we encourage you to take the opportunity to rebuild your soil productive capacity by growing cover crops for the remainder of the growing season.

Resources

Midwest Cover Crops Council Decision Tool

www.mccc.msu.edu

Choose cover crops for your particular goals and find the optimal planting dates for your county.

Indiana NRCS Cover Crops Seeding Tool

efotg.sc.egov.usda.gov/references/public/IN/IN_NRCS_Cover_Crops_Seeding_Calculator.xlsm

Calculate seeding rates for each species in a mix.

Midwest Cover Crops Field Guide

Available from the Purdue Extension Education Store, www.edustore.purdue.edu.

This pocket guide (Purdue Extension publication ID-433) contains more detailed information about selecting and managing cover crops and describes common cover crops.

Herbicide Carryover Table

Available from Penn State University Extension, extension.psu.edu/plants/crops/soil-management/cover-crops/herbicide-persistence/herbicide-carry-over-table.

Although published by Penn State, this table includes information that would fit Indiana.

Purdue Extension Agronomy Cover Crops

ag.purdue.edu/agry/extension/Pages/cover_crops.aspx

This site provides updates about current topics in cover crops.

Indiana NRCS Agronomy

www.nrcs.usda.gov/wps/portal/nrcs/main/in/technical/ecoscience/agronomy

This site provides information about soil health and other soil-related topics.

Find Out More

Find more publications in the *Managing Cover Crops* series by visiting the Purdue Extension Education Store, www.edustore.purdue.edu.

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