

Cover Crops for Prevented Planting Acres



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URL: <https://ag.purdue.edu/agry/extension/Documents/PreventedPlantingCovers2015.pdf>

Excessive rainfall and prolonged ponding conditions this spring have resulted in many fields remaining unplanted to corn or soybeans this season. These “prevented planting” acres, while unfortunate for this year’s production, should be managed in ways to prevent further soil degradation and to increase soil productivity for next year. Cover crops are an excellent option for producers to consider for protecting their soil and increasing productive capacity for succeeding years. This article briefly describes the benefits of growing cover crops compared to leaving the soil bare and fallow, and then it provides guidance on selecting and seeding cover crops for prevented planting acres.

Producers are advised to check with FSA and their crop insurance agent about harvest or grazing restrictions for cover crops.

Prolonged and excessive rainfall and ponding can cause soil aggregates to break down, especially near the soil surface. Flooding and erosion remove valuable topsoil and all the nutrients, organic matter and soil organisms it contains. When these fields finally dry out, the surface becomes hard and crusted and is prone to further erosion by water or wind. If tillage is performed to control weeds and the soil is left 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, growing a cover crop for the remainder of the season is crucial. **In fact, having something green and growing during all non-frozen times of the year is a key concept for improving soil health, decreasing nitrate leaching to drainage waters, and improving water quality.**

Improve soil structure and biological activity in topsoil

Cover crops protect the soil from further erosion by both water and wind. 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 which stabilize soil aggregates. Cover crops also provide additional food for soil fauna such as earthworms. The roots and soil biological activity also increase soil porosity and decrease density near the soil surface, leading to improved 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 growing 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 of subsequent cash crops. Prevented planting acres have a longer time window for these tap-rooted crops to grow than is present after typical soybean or corn harvest dates, and so the benefits can be substantially greater than possible in a normal year. If fields have so much compaction that deep tillage or subsoiling is required to remediate the condition, planting a deep rooted cover crop after the tillage operation will help stabilize the gains 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 over 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.

Selecting cover crops

When selecting which cover crops to plant, producers should consider their main purposes of the cover crops for their 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 will fix atmospheric nitrogen that can be used by next year's cash crop. Cowpeas are an excellent choice for mid-summer plantings, while hairy vetch, crimson clover, and winter peas can be planted through late summer. Be sure to inoculate all legume seed. Brassicas such as daikon radish, turnip, rapeseed and canola have tap roots that help break up tillage pans and improve permeability while being excellent nitrogen scavengers and can be planted mid- to late-summer. Note that planting daikon radish too early (before August) may result in the plant bolting and producing seed or in producing tubers larger than desired. Daikon radish should always be planted in a mixture with a grass, both to reduce the N losses during the rapid decomposition of the radish, and to 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 including two or three of the plant classes discussed above. These species mixes stimulate soil biological activity more quickly due to the diversity of crop and root types. A mix of a fibrous-rooted grass and a legume or brassica with a tap root will produce soil improvement throughout the soil profile.

There are several tools to help producers select cover crops for their situation in Indiana. The Midwest Cover Crops Council has a selector tool that was built starting with Indiana conditions and experience. Producers enter their state and county, and are provided with a chart of various cover crops and their planting date windows. Producers can further narrow the list by inputting up to three desired purposes of the covers, such as N scavenger or soil builder, and selecting from that list. A few common mixes are also included in that chart. The Indiana NRCS Seeding Tool also provides guidance on cover crop species and allows more flexibility in determining mixes. With prevented

planting there are obviously many more choices for cover crops than when seeding after corn or soybean harvest.

Other considerations for cover crop choices include whether the cover crop will winterkill or will overwinter. The advantage of those that winterkill is that the producer does not need to terminate them in the spring, but the overwintering species will continue to provide some additional growth and benefit next spring. Some summer planted cover crops may need to be managed by mowing or killing before seedhead formation to prevent them from becoming a weed next year. If residual herbicides were applied this year, producers should consult herbicide labels for plant back restrictions, as some covers are sensitive to some of the residual herbicides. Growers should also check with their crop insurance agents and FSA to understand any harvest or grazing restrictions related to cover crops on prevented planting acres.

Seeding cover crops

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 the crusted, hard top soil often present 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. Producers are encouraged to utilize the opportunity to rebuild soil productive capacity after a difficult spring by growing cover crops for the remainder of the growing season.

Choose your cover crops, seeding dates and rates, with the following tools:

Midwest Cover Crops Council Decision Tool, <http://www.mccc.msu.edu/selectorINTRO.html>
(choose cover crops for your particular goals, planting dates for your county)

Indiana NRCS Cover Crops Seeding Calculator, calculate seeding rates for each species in a mix, (http://efotg.sc.egov.usda.gov/references/public/IN/IN_NRCS_Cover_Crops_Seeding_Calculator.xlsm)

Additional Resources

- Midwest Cover Crops Council: <http://www.mccc.msu.edu>
- Midwest Cover Crops Field Guide, 2nd ed. Available from Education Store, Purdue Extension.
- Herbicide carryover— A good Extension publication from Penn State that fits Indiana is: <http://extension.psu.edu/plants/crops/soil-management/cover-crops/herbicide-persistence/herbicide-carryover-table>
- Purdue Extension cover crops: https://ag.purdue.edu/agry/extension/Pages/cover_crops.aspx
- Indiana NRCS Agronomy page: <http://www.nrcs.usda.gov/wps/portal/nrcs/main/in/technical/ecoscience/agronomy/>

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