USDA United States Department of Agriculture

Cover Crops to Improve Soil in Prevented Planting Fields

Natural Resources Conservation Service, Ohio

Prolonged rain and flooding have resulted in many fields that will go unplanted this year. Farmers in this situation need to weigh not only their program and insurance options (prevented planting) but should also assess agronomic options to ensure long term productivity.

Producers should explore the benefits of planting a cover crop that has the potential to capture applied nutrients, fix nitrogen, build organic matter, control weeds, control erosion, and/or improve soil health during the remainder of the season. Such a cover crop will protect the soil and yield potential for the following crops.

Producers are advised to check with USDA's Farm Service Agency (FSA), Risk Management Agency (RMA), and their individual crop insurance agent on prevented planting requirements, as well as haying, grazing, and harvest restrictions for cover crops grown on prevented planting acres.

A key soil health concept is to ensure that there is vegetation green and growing whenever possible.

Building versus Losing Topsoil
As excessive rainfall runoff cut across unprotected fields, the topsoil will be lost from erosion and scouring. With the productive topsoil lost, so too are the nutrients, organic matter, and soil biology. If tillage is applied to these water damaged fields to control weeds or repair damage, recognize the need to cover the field surface with a cover crop to prevent soil erosion, and loss of carbon, nutrients, and residue.

The above ground biomass, or vegetation, of cover crops will help protect the soil from further sun, wind, and water damage. Below ground will help soil life.

Selecting high biomass cover crop mixes will rebuild topsoil. Cover crops will add organic biomass both above and below ground to rebuild topsoil quicker than if left to grow weeds or especially if left with no cover.

Avoid removing biomass from the field by harvesting for forage to maximize the soil health and organic matter benefits.

Always check with your crop insurance agent, RMA, and FSA on restrictions for haying, grazing, and harvesting cover crops on prevented planting acres.

Careful consideration should be made when selecting a cover crop mix. Consider long-term goals and future crop needs and benefits, then compare them with the individual cover crop species characteristics to ensure they match.

Additional References

Natural Resources Conservation Service-Field Office Technical Guide (FOTG): https://efotg.sc.egov.usda.gov/#/

Midwest Cover Crop Council: www.mccc.msu.edu

Risk Management Agency-Prevented Planting: https://www.rma.usda.gov/en/Topics/Prevented-Planting

Sustainable Agriculture Research and Education (SARE): Managing Cover Crops Profitably https://www.sare.org/Learning-Center/Books/Managing-Cover-Crops-Profitably-3rd-Edition

Farm Service Agency https://www.fsa.usda.gov/

Ohio No-Till Council https://ohionotillcouncil.com

OSU Extension https://extension.osu.edu/home

Soil Biology, Structure, and Compaction
Many fields saturated for long periods lose soil organisms that create soil macro-pores and cycle nutrients. The saturated fields also lose beneficial soil biology, such as earthworms, mycorrhizal fungi and bacteria that builds structure and tilth. Without these organisms, the soils are very susceptible to compaction and crusting.

Some fields may be so compacted that remediation activities are needed. However, cover crops, whether used alone or in conjunction with other compaction remediation activities, are essential to rebuild healthy soil structure. The roots of cover crops help to penetrate compacted zones, hold soil aggregates together, and sustain healthy organisms to restore soil structure. Growing roots are essential to reestablish the mycorrhizae in the soil and to create pathways for air and water to move through the soil profile, which are key components to restoring the soil's functional properties and will keep the pathways open to result in a quicker fix of the compacted layers.

Building versus Losing Nitrogen
Cover crops can build organic nitrogen, and/or sequester residual nitrogen in the soil.

A legume or legume mix planted in the summer can help fix nitrogen for the next cash crop. Make sure all legume seed is properly inoculated.

Cover crops, including annual grasses and brassicas, can scavenge residual nitrogen from the soil, and even more in situations where manure or preplant nutrients have been recently applied. Additionally, this results in a more rapid gain in total soil biomass and a higher total nutrient availability for subsequent crops.

Herbicide Concerns
Ensure herbicides used with crops in the rotation are compatible with cover crop selection and purpose(s). Some herbicides will carry over in the soil and restrict cover crop establishment, uses, and growth.

Cover Crop Species Guidance
Cover crop selection and management should focus on maximizing both above and below ground biomass and encouraging nutrient cycling as deep in the soil profile as possible. Choosing a mix of a grass with a fibrous root system and a legume or brassica with a taproot will usually provide the widest range of benefits.

Planting flowering cover crops such as buckwheat or brassicas can be a valuable food source for a wide variety of pollinators. Leaving the growth and/or the grain can be a very valuable winter food source for a wide variety of wildlife.

Legumes alone or in combination with grasses can provide quicker soil biology/ biota restoration and nitrogen fixation. Growth and development of the legume is directly related to nitrogen fixation. An early summer planted legume such as cow peas, will grow rapidly and fix a good amount of nitrogen prior to a killing frost when it will be terminated. For later plantings, an overwintering legume such as red clover should be considered. Make sure all legume seed is inoculated.

Brassicas provide excellent weed control and nitrogen scavenging potential. The taproots are excellent at penetrating tillage pans and dense soil layers. However, planting them early (prior to August) may cause them to bolt and produce seed.

See Ohio Appendix A (cover crop) on eFOTG for cover crop species selection and guidance. Warm Season grasses and broad leaves should be considered first for prevented planting acres.

Seeding and Establishment
One of the challenges an early to mid-summer seeding poses is the timeliness of rainfall after seeding for germination. It is best if the seed is drilled or incorporated. This will also address concern about crusted soil and seed-to-soil contact. However, non-incorporating seed in wet conditions can allow for more timely applications.

OHIO
Natural
Resources
Conservation
Service
oh.nrcs.usda.gov