

Using Cover Crops to Improve Soil on Prevented Planting Fields

Natural Resources Conservation Service, Missouri



Prolonged rain and flooding can result in unplanted crop fields. Producers in this situation need to weigh not only their program and insurance options (“prevented planting”), but also assess agronomic considerations to ensure long-term productivity from this difficult situation.

Soil left with no vegetation is subject not only to erosion but also loss of organic matter, nutrients and living soil biota. Organisms living in the soil (i.e. fungi, bacteria, earthworms) are injured or killed by prolonged saturation or lack of living roots. These organisms play a critical part toward plant growth.

Cover crops have the potential to capture applied nutrients, fix nitrogen, build organic matter, control weeds, reduce erosion, and facilitate recovery of the soil biology during the remainder of the season. Using cover crops properly will improve soil health, can provide opportunities to increase forage availability for livestock, and build considerable yield potential for following crops.



A key soil health concept is to ensure there is vegetation green and growing during all times of the year.

Producers are advised to check with USDA's Farm Service Agency (FSA) administering the Emergency Conservation Program (ECP) if applicable and their crop insurance agent on prevented planting requirements as well as haying, grazing, or harvest restrictions for cover crops grown on prevented planted acres. USDA's Risk Management Agency (RMA) has posted frequently asked questions on delayed and prevented planting for producers on their website.

<https://rma.usda.gov/News-Room/Frequently-Asked-Questions/Prevented-Planting-Flooding>

Building vs. Losing Topsoil

As excessive rainfall runoff or floodwaters cut across unprotected fields, the topsoil may be lost

from erosion and scouring. When productive topsoil is lost, so too are nutrients, organic matter, and soil biology. Tillage applied to these water-damaged fields to control weeds or smooth scours/deposits can accelerate loss of carbon, nitrogen, and biomass. Above-ground biomass from cover crops helps protect the soil from further sun, wind, and water damage.

Selecting high biomass cover crop mixes can rebuild topsoil. Cover crops, especially when no-tilling, can add organic biomass both above and below ground. Properly selected cover crops can rebuild topsoil quicker than weedy or fallow fields.

Removing biomass from a field by harvesting forage or grain reduces the organic matter benefits. Grazing cover crops is a better way to utilize the forage value of the cover crop. Grazing invigorates soil biology, depositing most of the nutrients back to the field. *Follow Crop Insurance guidelines for harvest or grazing operations.*

Soil Biology, Structure, and Compaction

Fields saturated for long periods lose soil organisms (such as mycorrhizal fungi and rhizobia bacteria) that create soil macropores and recycle nutrients. Without these organisms to build structure and till, the soils are subject to compaction and crusting.

Soil structure is often lost when fields are flooded for long periods. Cover crops can rebuild lost soil structure. Cover crop roots penetrate compacted zones, hold soil aggregates together, and sustain healthy organisms. Growing roots are essential to reestablishing mycorrhizae in the soil and for creating pathways for air and water to move through the soil profile. These are key components to restoring the soil's functional properties.

Building vs. Losing Nitrogen

Cover crops can build organic nitrogen and/or scavenge residual nitrogen in the soil. Legumes, in combination with grasses, can provide quicker restoration of soil biology and N fixation. The amount of nitrogen fixed is directly related to growth and development of the legume. An early summer-planted legume, such as cowpeas, will grow rapidly and fix a substantial amount of N prior to a killing frost. For later plantings, consider using an over-wintering legume, such as hairy vetch. All legume seeds require inoculation.

A properly selected cover crop mix can scavenge more than 40 pounds of residual N 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 higher total nutrient availability for subsequent crops.

Herbicide Concerns

If spring residual herbicides were applied, refer to the label to determine replant interval for selected cover crop species. Some herbicides will carry over in the soil and restrict cover crop establishment and growth.

Cover Crop Management

Some cover crop species seeded early to mid-summer have the potential to develop seed. To



reduce the potential for seed production, mow the cover crop prior to seed head formation.

Cover Crop Species Guidance

Focus cover crop selection and management on maximizing both above- and below-ground biomass to encourage nutrient cycling as deep in the soil profile as possible. Choose a mix of a grass with a fibrous root system and a legume or brassica with a tap root to provide the widest range of benefits.

Planting wildlife-friendly cover crops such as buckwheat or brassicas can be a very valuable winter food source for a wide variety of wildlife and pollinators.

Brassicas, such as turnips and radishes, provide excellent weed control and nitrogen scavenging potential. When brassicas are planted, use a cover crop mix that includes a minimum of 50 percent grasses.

Seeding and Establishment

Timeliness of rainfall for mid- to late-summer seeding is critical for germination. It is best if the seed is drilled to improve seed-to-soil contact.

Additional References

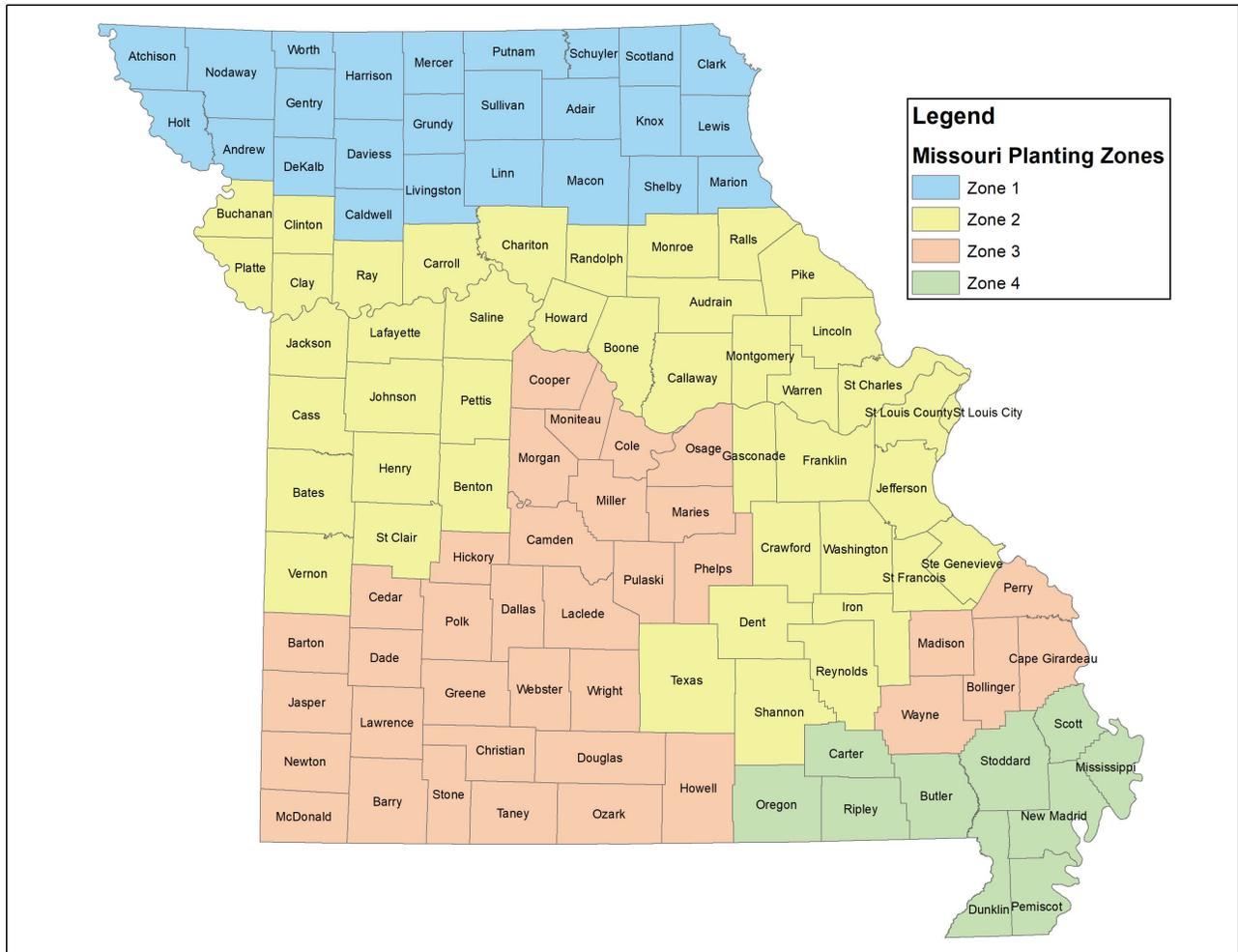
Midwest Cover Crop Council: www.mccc.msu.edu

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

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

Summer to Late Season Cover Crop Species and Planting Zones

For seeding rates refer to Missouri Cover Crop Conservation Practice Standard (Code 340)



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Cool Season Grasses - Planting Season by Zones						
Species	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Winter Barley						
Spring Oat						
Winter Oat						
Black Oat						
Winter Cereal Rye						
Winter Wheat						
Winter Triticale						

Warm Season Grasses - Planting Season by Zones						
Species	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Forage Sorghum						
Sorghum-Sudangrass						
Pearl Millet						

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Cool Season Broadleaves - Planting Season by Zones						
Species	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Canola/Rapeseed	[Blue bar]		[Yellow bar]			
	[Orange bar]		[Green bar]			
Oilseed Radish	[Blue bar]		[Yellow bar]			
	[Orange bar]		[Green bar]			
Turnip	[Blue bar]		[Yellow bar]			
	[Orange bar]		[Green bar]			
Collards or Kale	[Blue bar]		[Yellow bar]			
	[Orange bar]		[Green bar]			
Mustard	[Blue bar]		[Yellow bar]			
	[Orange bar]		[Green bar]			
Flax	[Blue bar]		[Yellow bar]			
	[Orange bar]		[Green bar]			
Phacelia	[Blue bar]		[Yellow bar]			
	[Orange bar]		[Green bar]			

Warm Season Broadleaves - Planting Season by Zones						
Species	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Buckwheat	[Blue bar]		[Yellow bar]			
	[Orange bar]		[Green bar]			
Safflower	[Blue bar]		[Yellow bar]			
	[Orange bar]		[Green bar]			
Sunflower, Black Oil	[Blue bar]		[Yellow bar]			
	[Orange bar]		[Green bar]			

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Cool Season Legumes - Planting Season by Zones						
Species	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Sainfoin	[Blue bar]					
	[Yellow bar]					
	[Orange bar]					
	[Green bar]					
Lentil	[Blue bar]					
	[Yellow bar]					
	[Orange bar]					
	[Green bar]					
All Vetches	[Blue bar]					
	[Yellow bar]					
	[Orange bar]					
	[Green bar]					
Crimson Clover	[Blue bar]					
	[Yellow bar]					
	[Orange bar]					
	[Green bar]					
Winter Pea	[Blue bar]					
	[Yellow bar]					
	[Orange bar]					
	[Green bar]					

Warm Season Legumes - Planting Season by Zones						
Species	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Chickpea (desi-type only)	[Blue bar]					
	[Yellow bar]					
	[Orange bar]					
	[Green bar]					
Cowpea (summer pea)	[Blue bar]					
	[Yellow bar]					
	[Orange bar]					
	[Green bar]					
Mungbean	[Blue bar]					
	[Yellow bar]					
	[Orange bar]					
	[Green bar]					
Sunnhemp	[Blue bar]					
	[Yellow bar]					
	[Orange bar]					
	[Green bar]					
Soybean	[Blue bar]					
	[Yellow bar]					
	[Orange bar]					
	[Green bar]					