USDA
United States Department of Agriculture
Natural Resources Conservation Service

COVER CROP BASICS
for Missouri

Environmental and ecological awareness has triggered resurgence in cover crop use in the United States. Cover crops can scavenge nutrients, increase organic matter, improve infiltration, reduce erosion, decrease compaction, and suppress weeds. In short, combined with no-till farming, cover crops can help solve a myriad of problems facing Missouri farmers.

COVER CROP BENEFITS

Farmers who are considering using cover crops need to decide what their primary goals are for using cover crops. Different cover crops provide different benefits, and no individual cover crop will provide all benefits. Some benefits include:

Controlling Erosion

- Cover crops reduce soil erosion on all types of soils by buffering the impact of raindrops and by holding the soil in place. Reduced soil erosion also keeps valuable nutrients and organic matter from blowing or washing away.

Improving Soil Health

- Cover crops help build organic matter. Organic matter holds soil particles together, increases water holding capacity, increases nutrient cycling, and provides food for microbes.
- Cover crops improve the physical properties that bind soil together.
- Deep-rooted cover crops can break through hard layers in the soil to increase the penetration of cash-crop roots, improve infiltration, and increase air pockets.
- Cover crops stimulate soil biological activity because their roots provide additional food for living organisms in the soil.
- Cover crops left on the soil surface help conserve soil moisture for later use by the cash crop.

Suppressing Weeds

- The shade from a dense stand of cover crops suppresses weeds.
- Chemicals that cover crops give off help suppress growth of other plants. This is called an allelopathic effect of the cover crop.

Improving Fertility

- Legumes capture atmospheric nitrogen. When the legume cover crop is terminated and it decomposes, much of this nitrogen is released for use by the next crop.
- Cover crops trap nitrogen, phosphorous, and potassium. This protects water quality, and makes nutrients available to the following crop. Nitrogen and nutrient scavenging is important after manure applications.

Enhancing Wildlife Habitat and Beneficial Insect Populations

- Cover crops attract beneficial insects, such as lady beetles and ground beetles.
- Cover crops provide water, cover, and food for wildlife.
- Cover crops increase landscape diversity, which benefits many groups of wildlife.

THINGS TO CONSIDER

Cropping and Tillage Systems

- What are the available time windows for the cover crops in each system?
- How can farmers adjust their crop rotations or manage their current crop rotations to implement cover crops?
- What cover crops will work with farmers' current crop rotations?

Climate -- Climate affects the length of the growing season available for cover crops.

Soil types -- Soil drainage needs to be considered. Some cover crops tolerate wet or droughty conditions while others do not.

Single species vs. many species mix -- it's often easier to manage a single cover crop, but a mix of species provides multiple benefits and improves the soil biology quicker.


Missouri farmer Bob Rugley includes tillage radishes in his cover crop mix.

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COVER CROP SEEDING TIPS

Plan early and locate cover crop seed in the springtime for planting in the fall.

Seed as soon as possible to get the greatest growth in the fall. Seeding methods may include no-till drilling, harrow seeding, narrow-row planting, broadcast seeding, or aerial seeding.

Plant cover crop seeds early and shallow (1/4 to 1/2 inch).

Use shorter-season varieties of corn (110-112 days) or soybeans to maximize cover crop benefits.

Leave crop residue on fields to preserve moisture.

Select cover crop varieties that are well suited for your area; avoid "Variety Not Stated" (VNS) seed.

When planting corn, apply starter nitrogen in row with planter.

Be aware that residual herbicide from the previous grain crop can inhibit cover crop establishment. This is especially noticeable in overlap areas, during dry years, and during late-planting years.

TERMINATING COVER CROPS

The four common methods of terminating cover crops are planting winter-killed species, tilling, mowing, and applying herbicides. Each method has its advantages and disadvantages.

When selecting an herbicide program for terminating a cover crop, consider all cover crop species in the mix. Also consider the cover crop growth stage, weeds, the production crop to be planted, weather conditions at application, and type of herbicide. It's easier to terminate cover crops in the vegetative stage, and before the plants make a seed head. Match herbicides to the cover crops. And use a grass herbicide initially; leave the legumes to fix more nitrogen, and then terminate the legumes later.

- Some cover crops do not overwinter in Missouri's climate. Learn which cover crops do not over winter in your area. Using those species eliminates the need to terminate them in the spring.
- The timing of herbicide application is important for some tough-to-control cover crops. For best results, spray herbicides on sunny days when temperatures are above 50 degrees.
- Tilling to terminate cover crops reduces the benefits of the cover crops. Tillage also increases erosion and reduces organic matter. Tillage is not recommended.
- Mowing or using a roller crimper can successfully terminate some cover crops at the flowering or heading stage. This may be later than desired for the typical row crop system in Missouri. This is a learned method for experienced cover croppers.

A SUGGESTION TO GET YOU STARTED

For a corn-soybean rotation, follow these steps

1. No-till cereal rye into corn stalks. You can drill late (October into November) and still be successful with establishing the cereal rye.
2. No-till soybeans into the terminated cereal rye. Plant an earlier group soybean to harvest earlier.
3. No-till a cover crop mixture with a low carbon to nitrogen ratio that winter kills, such as spring oats and oilseed radish.
4. No-till corn into the winter-killed oats and radishes.

March 2014