

CONSERVATION CROPPING SYSTEM FOR CORN-BEAN TILL

What's Your Strategy?



A **Conservation Cropping System** is a suite of practices that work synergistically to replenish soil life, restore organic matter to your farm's soils, and in return reduce risks. Over time these improvements increase nutrient efficiency and farm profitability, reduce sediment and nutrient losses, and make farms more resilient to extreme weather conditions. The practices are tailored specifically to your farm, with considerations such as the equipment you own, the crops you raise, and your soils, slope and proximity to water.



What Is the Purpose of a Conservation Cropping System?

The purpose of this Conservation Cropping System (CCS) recipe is to provide the starting steps for a corn-soybean farmer using conventional tillage to begin incorporating soil health management practices into the farming operation with low risk. If farmers implement these strategies on just a portion of their farms, they can learn by doing, and over time develop a CCS that works for their farm on all the acres.

Cover crops are not simply another growing-season choice, like which seed treatment to use, but instead cover crops are important tools for accomplishing long-term goals such as ensuring farm productivity and profitability for the next generation.

Best Type of Conservation Cropping System?

The best CCS is the suite of practices that work well with your farm to improve soil health while improving profitability. Every CCS includes practices to:

- 1) Reduce soil disturbance to the maximum extent possible
- 2) Keep a living root in the system for as long as possible
- 3) Diversify crop rotations
- 4) Keep the soil covered with living or dead (mulch) vegetation at all times

For every CCS, a good starting point is to have a fertilization plan that maximizes nutrient use efficiency through the 4Rs. The 4R concept incorporates the Right fertilizer source at the Right rate, at the Right time and in the Right place:

<http://www.nutrientstewardship.com/4rs/>

Step-by-Step Process for CCS Corn-Bean with a Mixed Tillage System:

Step 1) Harvest corn with a corn head that doesn't chop the stalks into confetti-like pieces. Drill a cover crop of cereal rye after corn harvest, or use a vertical tillage tool to incorporate the cover crop. Cereal rye seeding dates can vary once spring arrives so check with the Midwest Cover Crop Council's (MCCC) Cover Crop Selector Tool for seeding dates in your area: <http://mccc.msu.edu/covercroptool/covercroptool.php> (NOTE: A lower seeding rate can be used if planted early or on flat ground.)

Step 2) Terminate the cereal rye cover crop in the spring when it reaches 14-24 inches in height. No-till drill an earlier maturing soybean crop into the cereal rye mulch – use wide row spacing and plant an early season soybean. Note that it is possible to let the cereal rye grow to 4 feet tall before terminating, or even to no-till drill soybeans directly into the living cereal rye and terminate the rye after planting. However, in your first year of managing cover crops it is easiest to terminate the cereal rye early and enjoy greater peace of mind.

Key Considerations: What are your neighbors' cropping systems like, extra equipment you're likely to need, notes on timing, etc.

Step 3) Harvest soybeans and follow-up by drilling or incorporating with a vertical tillage tool daikon radishes (2 lbs/ac) and oats mixture (30 lbs/ac). It is important that this mix is planted early in the fall to obtain decent growth, (tops and roots) as growth will be minimal after a frost. Check with the MCCC's Cover Crop Selector Tool or a cover crops specialist for seeding dates in your area. (NOTE: One can also aerial seed this cover crop mix into standing soybeans.) This cover crop is meant to become green in the fall and not survive through the winter (three straight nights with a low of 20°F kills this cover crop), leaving a dead vegetative mulch to protect the soil.



Step 4) Plant corn at normal time, and consider using a shorter season variety. One tillage pass can still be made in the spring prior to corn planting, but plan for a cereal rye cover crop after harvest.

Observations

Timing is critical for the oats/radish cover crop. Aerial seeding is successful and can be done (1) when soybeans are still completely green, (2) when the leaves have just started to yellow, or (3) after a leaf-drop has just started. The critical factor is moisture – moist soil or a moistening rain after seeding ensures success for this method. Dry soil or little-to-no rain may result in a poor stand. Ammonia can be knifed into the living covers to help with this.

The cereal rye cover crop is much less sensitive to temperature and one can still achieve a good-stand planting into November. If planted late, the cereal rye puts more energy into the roots. There may only be an inch or two of green-top growth going into winter, but do a little digging to observe the root depth. The roots may grow as much as 12 inches with only 2 inches of top growth! Do not plant cereal rye ahead of corn when first learning to use cover crops. Corn can be adversely affected by immobilized nitrogen associated with a high Carbon:Nitrogen cereal grain like rye. Farmers using cereal rye ahead of corn are terminating it early and using at least 40 lbs/ac of nitrogen starter fertilizer.

This picture demonstrates a simulated 1" rain event. The two silver pans hold the same soil type. The soil on the left is tilled annually, while the soil on the right has been managed with continuous no-till and cover crops for 7 years. The pans below the soil collect the water.



More rainfall infiltrated through the cover-cropped soil, while more rainfall ran off the surface of the tilled soil.

Continual Learning:

Seek out "farmer mentors" – look for farmers in the area who are implementing soil health management practices. Consult with Soil Health Specialists and find field days at the Illinois Sustainable Ag Partnership: www.ILsustainableAg.org. Stop in your local USDA Natural Resources Conservation Service and county Soil & Water Conservation District office for technical and financial assistance with the conservation practices discussed in this fact sheet:

<https://www.nrcs.usda.gov/wps/portal/nrcs/main/il/contact/local/>

Sign up for updates with the Soil Health Partnership & find other farmers, field days, and professionals:



www.soilhealthpartnership.org

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