

Conservation Practice Fact Sheet

December 2015

Introduction

Cover crops are considered the backbone of any annual cropping system. Cover crops capture and recycle nutrients, reduce soil erosion from wind and water, improve soil health and organic matter content, help manage soil moisture, suppress weeds, provide supplemental forage, and increase biodiversity. Cover crops include annual grasses, legumes, and other broadleaf plants such as buckwheat, rapeseed (canola), kale, turnips, and forage radishes.

Cover crops cannot be harvested for seed, but may be used for grazing or cut for forage. However, these activities may not be allowed when the cover crop is enrolled in a financial assistance program. Check with your local NRCS Service Center for more information.

Benefits of Winter Cover Crops

In Delaware, an important purpose of a winter annual cover crop planted in the late summer or early fall is to scavenge and recycle nutrients. For example, corn is inefficient at utilizing nitrogen fertilizer, so it is important to immobilize the nitrogen that remains in the soil profile. In late August, the corn plant slows its uptake of nutrients, but the soil is still warm and the microbes are actively mineralizing nutrients. A cover crop planted immediately following corn harvest will capture a significant portion of the surplus nutrients, reducing the potential leaching to groundwater during the late fall and winter when the evapo-transpiration (ET) rate has slowed.

In addition to nutrient uptake, winter cover crops also provide cover for the soil surface. This cover helps to protect the soil from the erosive effects of rainfall and wind. It also slows surface runoff and allows for improved infiltration, resulting in reduced soil erosion.

A legume is often added to a winter cover crop for the added benefit of nitrogen fixation. Hairy vetch and clovers can be mixed with a complementary winter grain such as cereal rye, barley, or wheat. In the spring when the cover crop is killed, the legume will supply nitrogen to the following crop.



Wheat cover crop planted to reduce soil erosion and nutrient leaching.

The terminated cover crop will also help retain soil moisture due to its mulching and shading effect. This can help the summer crop to survive a short-term drought without severe moisture stress.

Benefits of Summer Cover Crops

Summer annual cover crops such as sorghum, sudangrass, and sorghum-sudangrass (sorghum X sudangrass) hybrids have the ability to improve soil tilth. Their foliage and root growth adds organic matter to the soil and helps to suppress weeds. Other beneficial summer cover crops include cowpeas for nitrogen fixation and buckwheat for summer weed suppression.

If feed is needed for cattle, cut the forage sorghum-sudangrass hybrids between 24 inches of plant height and boot stage. In addition to providing forage for livestock, summer cover crops can provide wildlife food benefits for doves, turkey, and deer.

Cover Crops for Water Quality

When managing for nutrient uptake, consider using winter hardy species such as cereal rye, wheat, barley, and annual ryegrass. Plant as early as possible to maximize plant growth and nutrient uptake before the dormant season. Cereal rye planted before October 1st is the most beneficial species for nutrient uptake.

Land owners and managers please note: *If you received financial assistance for your cover crop, be sure to check with your funding agency/organization for specific management requirements.*

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Application of commercial fertilizer or manure is not allowed prior to planting the cover crop. However, in very limited circumstances and when approved by a nutrient management consultant, 20 to 30 lbs./ac. of starter N may be applied prior to planting. In these situations where there is limited available N due to excessive rainfall or high yields utilizing irrigation, starter N allows the cover crop to develop a stronger root system that can scavenge N from deeper in the soil profile. No phosphorus can be applied.

No winter application of commercial fertilizer or manure is allowed. Spring application of manure can resume after March 1st in Sussex County and March 15th in Kent and New Castle Counties. Application of nutrients must be in accordance with a nutrient management plan.

Do not terminate cover crops until after March 15th. If spring peas are to be planted, the cover crop can be terminated after March 1st.

Cover Crops for Soil Health

Consider increasing the diversity of cover crops (e.g., by using mixtures of several plant species) to improve soil health by promoting micro-organisms that break down crop residues into organic matter, cycle nutrients, and build strong soil aggregates for increased available water holding capacity within the soil profile. Cover crops can also address compaction issues when deep-rooted species such as tillage radishes are planted. When choosing a cover crop mix, consider your soil health goals to obtain the maximum benefit.

Cover Crops for Weed Control and Pest Management

Cover crops may also be used to suppress weeds, plant pests, and pathogens. A dense planting of cover crops can provide direct competition that suppresses weed seed germination and seedling growth. Consider using higher seeding rates (1.5 to 2 times normal) to promote rapid canopy closure and greater weed suppression. After cover crop termination, residue can be left on the surface as mulch for additional weed control.

Allelopathic chemicals released during cover crop growth and decomposition may also provide weed control benefits. Winter rye and other winter cereal grains, sorghum and sorghum-sudangrass hybrids, rapeseed (canola), buckwheat, and subterranean clover have been shown to have allelopathic effects on weeds.

To break pest life cycles or suppress plant pests or pathogens, select cover crop species that do not harbor pests or diseases of subsequent crops in the rotation. Cover crops that provide food or habitat for natural enemies of pests, and/or release chemicals such as glucosinolates that suppress soil borne pathogens or pests, may also be useful for biological pest management.

Recommended Cover Crop Species, Seeding Rates, Seeding Dates, and Planting Methods

Refer to Tables 1 and 2 of the Delaware Conservation Practice Standard Cover Crop (340) for a list of acceptable species and recommended planting dates. Check with your seed dealer regarding actual seeding rates for broadcasting or drilling the variety you purchase.

To determine how much seed to buy, divide the seeding rate by the percent germination on the seed tag. For example, a 40 lb. seeding rate divided by a 92% germination rate ($40 \div 0.92$) = 43 lbs. of seed needed per acre. Remember to inoculate legumes with the recommended *Rhizobium* bacteria.

For best results, use a planting method that incorporates the seed into the soil. Conventional drilling into a prepared seedbed, no-till drilling, or broadcasting followed by light soil incorporation (e.g., with a cultipacker, vertical tillage, rolling basket, or light disking) are preferred seeding methods because they optimize seed-soil contact.

Aerial seeding or broadcasting without incorporation may be used, but these methods require seeding rates that are at least 30% higher than the incorporated rate to compensate for poorer seed distribution and/or germination.

If you need additional information about cover crops, please contact your local NRCS Service Center.

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