

# NORTH DAKOTA COVER CROP RECIPE

MCCC-102

## Starting with Cover Crops in North Dakota

*This publication is intended to provide a starting point for farmers who are new to growing cover crops. With experience, farmers may fine-tune the use of cover crops for their systems.*

### Introduction

Fitting cover crops into rotation can be challenging depending on which crops are grown. That challenge is further enhanced by a short growing season in this region. If you have a small grain or other short-season crop in rotation, it is easier to fit a cover crop after an early crop harvest. Farmers interested in using cover crops could consider including small grains in rotation to create that window of opportunity for cover crops when first starting this practice.

It is highly recommended that each producer identify *specific goals* for each field/farm and choose cover crops that can provide functions to achieve those goals. Functions and goals of cover crops for a basic recipe are described in Table 1.

### Basic Starting Points for Common Crop Sequences

The following mixes are selected for North Dakota because they should be low risk for herbicide carryover injury and have a low chance for becoming weedy. The general recipe includes a grass (such as cereal rye and oats) and a brassica (most commonly radish). Producers can add flax to either if a three-species mix is desired. Recommended seeding rates for these mixes are included in Table 2.

- **Spring or winter wheat–soybean:** *Cereal rye, radish, flax*

Early fall harvest of wheat broadens options and will provide more benefit. Consider using a stripper head for wheat to leave residue standing and avoid a mat, or straight cut wheat as high as possible. Covers should be drilled immediately after field is harvested to maximize time for growth. Cereal rye, radish, and flax mixture will help manage soil moisture, cover the soil, promote infiltration, and provide food for beneficial insects. Cereal rye should be monitored closely for moisture use in the spring. If the seedbed is drying too quickly,

the rye needs to be terminated. If there is excess moisture, the rye can continue to grow and soybean can be planted into the living cereal rye (called planting green). Terminate the cereal rye with a full rate of herbicide. Make sure disk openers on planting equipment are sharp to cut through residue.

- **Corn-soybean:** *Cereal rye or barley, and radish*

Given limited to no growing time following corn harvest, interseeding of corn is preferred between V5- to V8-stage corn, depending on available equipment clearance and access to the field. Broadcast or aerial seeding of cereal rye or barley, and radish will help manage water and salinity, compete with weed pressures, and promote soil aggregation. Manage corn residue both on the back of the combine and by using a non-chopping head to leave cornstalks standing. The mat of cornstalks created by a chopping head will result in wet soil conditions the following spring and cornstalks blowing across the field over winter. Cereal rye will overwinter and provide spring cover crop growth and water management.



Figure 1. Field with cereal rye aerially seeded into standing soybean (Abbey Wick)

- **Soybean-corn:** *Barley and radish*

Covers should be drilled immediately after field is harvested to maximize time for growth. Barley and radish have some cold tolerance. Having these cover crops will help reduce erosion, manage salinity, and

promote infiltration. Cereal rye prior to corn is higher risk and requires specific management in the spring. Broadcasting cover crops into soybean prior to leaf drop is also an option, but this requires more experience to get timing correct to avoid possible smearing on the beans from green material.

• **Soybean-soybean:** *Cereal rye or barley*

Covers should be drilled immediately after field is harvested to maximize time for growth. Cereal rye or barley will help reduce erosion, and cereal rye will overwinter to use moisture in the spring.

**Four Tips for Using Cereal Rye**

1. Depending on conditions, cereal rye can be seeded late into the fall, with a majority of growth occurring in the spring.
2. Increase rates with later seeding dates.
3. Use higher rates when broadcasting versus drilling.
4. Terminate 14 days in advance of planting corn, and never use cereal rye before a wheat or barley crop.

Table 1. Functions and goals of cover crops

Functions	Description and Goals	Cover Crops
Soil builders	Crops with fibrous root systems add organic matter to the soil and build aggregation.	Cereal rye, oat, barley, triticale
Nitrogen fixers	Legume crops fix atmospheric N <sub>2</sub> by symbiotic association with soil bacteria.	Forage pea, field pea, winter Austrian pea, faba bean, clovers
Nutrient capture or release	Plants with a taproot that reaches 4–6 ft. deep capture nutrients lost from the crop rooting zone. Flax also releases P from the soil, increasing its availability.	Radish, rapeseed, flax
Soil looseners	The thick taproot of brassicas reduces soil compaction and increases water infiltration.	Radish, rapeseed
Soil erosion preventer	Cereals cover the soil in late fall, and winter-hardy cereals provide soil cover and protection in the spring.	Cereal rye, barley, oat
Weed suppression	Crops release allelopathic compounds, reducing the growth of weeds.	Cereal rye
Water management	Winter-hardy crops use moisture early in the spring.	Cereal rye

Table 2. Seeding rate for crops in mixes or alone

Crop Sequence	Crops	Planting Method	Seeding Rate <sup>†</sup> (lbs./acre)
Wheat-soybean	Cereal rye, radish, flax	Drill	30, 2, 2
Corn-soybean	Cereal rye or barley, and radish	Aerial broadcast	50 or 50, 2
Soybean-corn	Barley, radish	Drill	30, 2
Soybean-soybean	Cereal rye or barley	Drill	30 or 30

<sup>†</sup> These seeding rates are based on high-quality seed with germination rates of 85–98% and purity >90%.

**Resources**

**North Dakota State University Soil Health** at <https://www.ndsu.edu/soilhealth/>

**Midwest Cover Crops Council: North Dakota**, <http://mccc.msu.edu/statesprovince/north-dakota/>

**Cover Crop Selector Tool**, <http://mccc.msu.edu/selector-tool/> — available from the Midwest Cover Crops Council, [www.mccc.msu.edu](http://www.mccc.msu.edu)

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The Midwest Cover Crops Council ([www.mccc.msu.edu](http://www.mccc.msu.edu)) aims to facilitate widespread adoption of cover crops throughout the Midwest by providing educational/outreach resources and programs, conducting new research, and communicating about cover crops to the public.

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