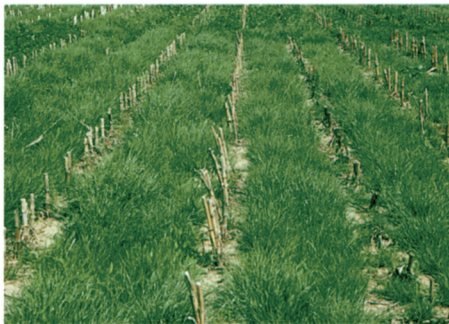




*Red clover*



*Annual or perennial ryegrass*



*Cereal rye*

### Want more information?

Contact your local office of Natural Resources Conservation Service, Soil and Water Conservation District, Cornell Cooperative Extension, or Certified Crop Advisor.

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# Cover Crops in Corn

## A Guide for Corn Producers



## Benefits of Cover Crops

- Reduces soil erosion
- Retains nutrients within plow layer
- Improves water quality
- Improves air and water movement through soil
- Suppresses weeds
- Provides early spring forage
- Provides habitat for wildlife

## Environmental Concerns of Agriculture

**Reduce soil erosion.** Cover crops provide erosion control and other benefits to fields in corn production. They reduce water runoff from cropland that may contain soil, crop nutrients, pesticides, animal waste, and other organic matter. The loss of nutrients and pesticides can lower crop productivity, reduce pest control, and increase production costs. In addition, the loss of soil can eventually lower the productivity of your land.

**Improve water quality.** Movement of soil, nutrients and pesticides into water resources will pollute streams, contaminate drinking water supplies and damage wildlife habitats. Nitrogen contamination of ground and surface waters is of widespread concern, particularly on farms that receive heavy manure applications. Cover crops take up excess nitrogen left in the soil after corn harvest. When they resume growth in the spring, they continue to remove leachable nitrates. On bare fields these nitrates would move below the root zone before the new corn crop is even planted.

**Enhance air and water movement through soil.** Soils cropped to continuous or long rotation corn silage may show declining organic matter levels, which can cause reduced water infiltration, compaction and lower yields. Well-established cover crops can contribute a ton or more of above-ground dry matter per year to the cropping system and their roots can open channels in the soil to facilitate air and water movement. Thus, cover crops can offset the deteriorating soil physical conditions frequently found in fields that are cropped continuously to corn silage.



*Drilling cereal rye after corn harvest*



*Interseeding ryegrass or clover with spinner at cultivation*



*Aerial seeding of cereal rye cover crop*

## Getting Started

1. Identify your primary cover crop need.
2. Select the seeding time convenient to your farming system.
3. Choose the most appropriate species.
4. Review/revise your weed management for compatibility with the cover crop.
5. Decide on seeding method/equipment.
6. You're now ready to initiate your field operations.

## Management is The Key to Success

### Identify Your Primary Cover Crop Need

Cover crops can protect the soil against erosion, improve soil physical properties, reduce nitrate leaching, add nitrogen to the cropping system, or suppress weeds. It is impossible to find one cover crop to meet all these needs. Many species can be used as cover crops, but no single species will serve every farm or field. So first identify your primary need.

### Seeding Time and Species Selection

Our short growing season is the major constraint to cover crop use in NY. Choice of species and subsequent growth are largely determined by seeding date. In NY we have three windows of opportunity for seeding cover crops.

**1. After Silage Harvest.** Cereal rye is the most reliable species that can be established at this time. Best results are obtained when the seeding is made before September 20; however, by using certified cereal rye seed (Aroostook) or increasing the seeding rate of common rye to 3 bu/ac, seedings may be made

into October. Inspect uncertified seed carefully to make sure it is free of weed seed. *Cereal rye* produces large amounts of above-ground biomass and will also take up residual soil nitrates.

**2. Interseed At Cultivation.** Red clover and ryegrass can be successfully seeded at this time. Choice of species depends on the primary function the cover crop serves.

*Red clover* can contribute nitrogen to the cropping system and its vigorous root system may help alleviate compacted soils. If nitrogen contribution is the primary need, the clover must be allowed to grow until mid-May.

*Ryegrasses* (annual or perennial) may be used to take up residual soil nitrates, and their well-developed root systems can improve compacted soils. They are well suited to conservation tillage systems.

Cover crops should be seeded when the corn is 12 to 18 inches tall. Seeding can be done simultaneously with sidedressing nitrogen and/or cultivation. Successful establishment depends on timely rainfall. Use seed with at least 80% germination.

**3. Aerial Seeding at Tasseling.** Cereal rye, the only appropriate species at this time, can be flown on the last two weeks of August. Successful establishment depends on timely rainfall.

### Weed Management

**Seeding after silage harvest** gives most flexibility in weed management because there is less residual activity from herbicides I applied to corn.

**Interseeding at cultivation** usually requires minor changes in weed management because herbicides used in corn can also control the cover crops. Band application (10-12 inches over the corn row) at planting combined with

one or two cultivations will usually control weeds. For broadcast applications, choose a herbicide compatible with the cover crop.

### Seeding Method/Equipment

**After Silage Harvest.** A no-till drill or a grain drill with packer wheels will provide best emergence and early growth. Good stands can also be achieved by spinning, disking, followed by rolling.

**Interseed At Cultivation.** With red clover and ryegrass, best stands can be obtained by cultivating with a spinner spreader attachment to throw seed behind the cultivator.

**Aerial Seeding.** Aerial seedings can be made with fixed-wing aircraft or by helicopter.

**Spring Management.** All cover crops listed can be grazed or green chopped in the spring or managed as a hay crop. If corn is planted again, tillage will determine spring management.

- If using **conservation tillage systems** such as no-till or mulch till, apply a burn-down herbicide when the cover is 4-8 inches tall. If cereal rye exceeds 18 inches, harvest before applying herbicide.
- If **conventional tillage**, plow and fit the field before the cover crop becomes too tall.

**Manure Management.** Apply manure only to an actively growing crop with a root system that can take up the nitrogen in the manure.

## Economics of Cover Crops

Cover crops are cost-effective because they:

- save nitrogen
- improve soil tilth
- maintain or increase soil organic matter
- control erosion
- improve water quality.

<b>Seeding Opportunity</b>	<b>Seeding Time</b>	<b>Species</b>	<b>Seeding Rate</b>	<b>Benefits</b>
After silage harvest	September 1 – 20	Cereal Rye	2 – 3 bushels/acre (112 – 168 lbs./acre)	Provides soil cover. Reduces nitrate leaching. Suppresses weeds. Provides spring forage.
Interseed at cultivation	June/July when corn is 12” – 24”	Red Clover (medium or mammoth)	10 – 12 lbs./acre	Provides soil cover. Adds nitrogen. Improves soil physical properties. Improves traction at harvest. Provides spring forage.
Interseed at cultivation	June/July when corn is 12” – 24”	Ryegrass (annual or perennial)	18 – 20 lbs./acre	Provides soil cover. Reduces nitrate leaching. Improves soil physical properties. Improves traction at harvest. Provides spring forage.
Aerial seeding at tasseling	Last two weeks in August	Cereal Rye	2 – 3 bushels/acre (112 – 168 lbs./acre)	Provides soil cover. Reduces nitrate leaching. Improves traction at harvest. Provides spring forage.