

## Cover Crop Guidance

revised: 9-30-2021

### Single Species:

At a minimum, the seeding rate must equal the recommended seeding rate for the cover crop being seeded. Higher rates are acceptable depending on the purpose and location in the state.

### Multiple species:

For cover crop mixes the sum of the Percent Full Rate column on the job sheet should never be less than 100% since it is the sum of the percent of the recommended rate for all species in the mix. It will normally be greater than 100% but should not exceed the upper limit listed on the table below depending on your location in the state or if the field is irrigated.

**Recommended Percent Full Rate based on Vegetative Zone**

|                  |          |
|------------------|----------|
| Zone I           | 100-125% |
| Zone II          | 100-150% |
| Zone III         | 100-175% |
| Zone IV          | 100-200% |
| Irrigated Fields | 100-200% |

**Note:** The sum of the Percent Full Rate column is easily skewed by species with low (< 10 lbs/ac) recommended seeding rates such as turnip, radish & sunflower. It is recommended that these not be included in determining if the mix meets the criteria based on the sum of the Percent Full Rate column.

### Minimum Seeds per Square Foot:

The number of seeds per square foot will vary depending on the species selected, however, for erosion control mixes based on cereal grains such as oats, rye, wheat, or triticale a minimum of 25 seeds per square foot is **REQUIRED**. For mixes based on annual ryegrass the minimum seeds per square foot would be 125.

For ephemeral erosion control a minimum of 30 seeds per square foot is **REQUIRED** for mixtures based on cereal grains. Annual ryegrass is not recommended for ephemeral erosion control.

### Adjustments to Seeding Rates:

Broadcast rates will be 1.5 times the recommended seeding rates. The job sheet will automatically adjust the recommended seeding rate if broadcast is selected as the seeding method.

Seeding rates for single species cover crops may be increased by up to 50% if grazing is a purpose and should be increased 20-75% if erosion control is the primary purpose to meet the minimum seeds per square foot requirements. For example, if Northern cereal rye is to be drilled in concentrated flow areas, the recommended rate for rye would be 87 lbs/ac which would be 30 seeds per square foot.

**Seeding Dates:**

Some flexibility in seeding dates is allowed. Depending on the year cover crops could be seeded as much as 7-10 days before or after the recommended seeding dates listed in the data table. Cereal rye may be seeded 2-4 weeks following harvest of corn or soybeans to facilitate early spring establishment. Cover crops that frost terminate should be seeded at least 6-8 weeks prior to first killing frost unless they are included as a minor component in a mix with frost tolerant species.

**Seeding Methods:**

Essentially there are two methods for seeding cover crops. Broadcast seeding, which includes aerial seeding into a standing crop prior to harvest, and direct seeding with a drill or air seeder. Direct seeding is the preferred method in that it ensures good seed to soil contact, generally results in more uniform stands, and reduces predation of seed by wildlife. However, broadcast seeding allows cover crops to be seeded earlier and when conditions may not allow direct seeding. There are several things to consider when broadcast seeding to improve chances of success including timing, cover crop species, seed size, soil and weather conditions at seeding time, and the amount of residue cover.

Generally, broadcast seeded cover crops should be sown at least 7-10 days earlier than drilled cover crops, because they are somewhat slower to establish a stand. Seeding into standing soybeans should be done before the soybeans have dropped more than 10% of their leaves. The leaf fall that will occur after seeding will act as mulch to cover the seeds and conserve soil moisture. Broadcast seeding into standing corn should be delayed until the kernel milk line is at least 50% formed or when the corn leaves begin to die about a third of the way up the stalk. This gives the seed a better chance of getting to the soil surface. It also allows for more light to reach the cover crop after the crop emerges, all the way until harvest.

Most species of cover crops will produce adequate stands for winter and early spring soil protection when broadcast on the soil surface, provided that the proper weather and soil surface conditions are present. Cereal grains (e.g., wheat, rye, oats, barley, triticale) are the easiest to establish by broadcast seeding if moisture and soil conditions are suitable. Legumes, especially large-seeded legumes, like vetch and winter peas, establish better with good seed-to-soil contact obtained by direct seeding methods. Broadcast seeding is not recommended for very small or light seeded species.

Broadcast seeding requires enough moisture in the top ½ - 1 inch of soil to ensure adequate moisture for the seed to germinate and establish. This moisture needs to be present at the time of seeding or should be expected to occur within 10 days of seeding.

Broadcast seeding is not recommended following high residue crops especially if there is a large amount of residue on the soil surface.

**Species Diversity:**

For determining the species diversity of a cover crop mix, use the Percent by Number of Seeds column (% by # seeds). If increasing biodiversity is an objective the mix should contain a variety of crop types and they should be adequately represented based on number of seeds. In developing a cover crop mix be sure it includes at least one different crop type than the cash crop that it follows.

If a producer wants to try a species that is not in the data table, contact your Area Resource Conservationist for approval.

### Using Bin Run Seed:

The use of bin run seed is allowed providing the producer is using their own seed and the use of the seed does not violate any patent or labeling restrictions associated with certified or GMO seed.

Producers should not purchase bin run seed unless the seller provides them with a label or seed tag that meets the requirements of the Nebraska Seed Law. In addition, the seller must have a valid seed permit from the Nebraska Department of Agriculture. Likewise, a producer may not sell bin run seed unless they have a valid seed permit, and the seed has been tested and labeled per the requirements of the Nebraska Seed Law.

Producers using bin run seed must provide scale tickets to document the pounds per acre of bin run seed that was planted.

### Grazing Cover Crops:

Supplemental grazing is authorized for some of the CSP cover crop enhancement activities (refer to the CSP Enhancement Job Sheet to see if grazing is allowed) and for all EQIP 340 Cover Crop Scenarios. The following should be taken into consideration when planning a cover crop mix that will be grazed.

- Different cover crop species have varying tolerances to grazing. Select species that are rated high for supplemental grazing on the Species Selection tab.
- Pesticides used on the previous crop. Some pesticides have restrictions on grazing following application (up to 18 months). Refer to pesticide labels. Some pesticides have restrictions on grazing following application (up to 18 months). Refer to pesticide labels.

### Recommended evaluation timing and requirements for practice certification based on cover crop objective:

To verify seeding rates receipts showing pounds of seed purchased or scale tickets showing pounds of bin run seed used are required.

- |  |                                       |
|--|---------------------------------------|
| • Reduce Erosion                           | - At termination – verify 6-8" height |
| • Biological Nitrogen Fixation             | - After Emergence – verify uniformity |
| • Pest Suppression                         | - After Emergence – verify uniformity |
| • Increase Soil Organic Matter             | - After Emergence – verify uniformity |
| • Seedbed Prep. For Grass Seeding          | - At termination – verify 12-18"      |
| • Provide Supplemental Grazing             | - At termination – verify uniformity  |
| • Increase Biodiversity                    | - After Emergence – verify uniformity |
| • Attract Beneficial Insects               | - After Emergence – verify uniformity |
| • Minimize and Reduce Soil Compaction      | - After Emergence – verify uniformity |
| • Capture, Recycle, Redistribute Nutrients | - After Emergence – verify uniformity |

## Species Selection Guide

Most of the information included on this tab came from Table 1 of the old cover crop practice standard, Charts 2 and 4A from “Managing Cover Crops Profitably”, the “Midwest Cover Crops Field Guide”, and the ARS Cover Crop Chart. The table is not complete because there is a limited amount of information about some of the species included on the table. A brief description of some of the columns follows.

**Dormant Seeding** – Planting seed after the soil temperature is below that temperature at which the seed will germinate. The window of time to dormant seed is important. If done too early, the seed may germinate after planting and those immature seedlings often won't survive the winter. Dormant seeded cover crops must be drilled while the ground is not completely frozen, but soil temperatures are cold enough germination of the seed will not occur until soil temperatures rise, usually the next spring. An average soil temperature target of 40 degrees or lower will typically inhibit the germination of most cover crop species. Soil temperatures are typically below seed germination temperatures from mid-November to mid-March depending on your location within the state. Table 1 in [NebGuide G2122](#) lists the minimum soil temperature for germination for several agronomic and horticulture crops and the figures show the dates on which different areas of the state reach specified average soil temperatures.

When planning a cover crop seed mix as a dormant seeding:

- Select species that are recommended for dormant seeding and seed them at a rate which alone will provide an opportunity for success to address the primary resource concern. Other species that are not normally recommended for dormant seeding can be included as a minor component of the mix.
- The seed must be drilled at the proper depth to ensure good seed to soil contact.
- Achieving the recommended cover crop growth in the spring is the critical measurement of success when addressing a soil erosion resource concern with a dormant seeding.

**Biomass Production** – A quantitative estimate of the range of dry matter produced in lbs/ac/yr. As some of the data is based on research plots, irrigated systems or multi-cut systems and the cover crops were grown to flowering or maturity, biomass production for typical cover crop applications will probably be toward the lower end of the range.

**Lasting Residue** – Rates the effectiveness of the cover crop in providing long lasting mulch and assumes that the cover crop is grown to the reproductive stage.

**Erosion Reduction** – Rates how extensive and how quickly a root system develops and how well it holds the soil. Applies primarily to when the cover crop is actively growing. Long term erosion control should be based on biomass production and lasting residue.

**Total N** – A quantitative estimate of the total N provided by a pure legume stand from all biomass (above and below ground) in lbs/ac. This is total N, not the fertilizer replacement value.

Additional information can be found in “Managing Cover Crops Profitably”.

## REFERENCES

A. Clark (ed.). 2007. Managing cover crops profitably. 3rd ed. Sustainable Agriculture Network Handbook Series; bk 9.

Midwest Cover Crop Council. Midwest Cover Crops Field Guide.

Pathak, T.B., K.G. Hubbard, and M. Shulski. 2012. Soil Temperature: A Guide for Planting Agronomic and Horticulture Crops in Nebraska. University of Nebraska Extension [NebGuide G2122](#).

USDA-ARS. 2018. Cover Crop Chart (v. 3.0). Available for download at:  
<https://www.ars.usda.gov/plains-area/mandan-nd/ngprl/docs/cover-crop-chart/>