

Water Quality Enhancement Activity – WQL10 - Plant a cover crop that will scavenge residual nitrogen



Enhancement Description

Plant a cover crop that will scavenge nitrogen remaining in the soil after the harvest of a previous crop. Suitable cover crops include those with at least a “Very Good” rating for scavenging nitrogen as documented in *“Managing Cover Crops Profitably, 3rd Edition”* (Sarrantonio, 1998), Chart 2 Performance & Roles, pg 67. Examples include cereal rye, barley, forage radish and sorghum sudan.

Land Use Applicability

Cropland

Benefits

Planting an annual cover crop to scavenge residual nutrients from cropland after the harvest of a previous crop effectively utilizes residual nutrient resources to supply following crops with nutrients required to efficiently produce food, forage, fiber, and cover while minimizing environmental degradation.

Conditions Where Enhancement Applies

This enhancement applies to only annually planted crop land use acres.

Criteria

Implementation of this enhancement requires:

1. The cover crop selected shall have the growth rate and rooting depth required to effectively scavenge residual nitrogen from the root zone of the previous crop. Suitable cover crops include those with at least a “Very Good” rating for scavenging nitrogen as documented in *Managing Cover Crops Profitably, 3rd Edition, Chart 2 Performance & Roles, pg 67*. Examples include cereal rye, barley, forage radish and sorghum sudan.
2. Timing of planting and seeding rates for cover crops shall follow the recommendations as available in the local NRCS Field Office.
3. The participant must have a current soil test (no more than 3 years old).
4. Nitrogen application rates for the crop following the cover crop must be reduced by the “Land Grant University (LGU) recommendations to account for the recycling of N by the cover crop.

Adoption Requirements

This enhancement is considered adopted when all of the above criteria have been implemented on the land use acre.



United States Department of Agriculture
Natural Resources Conservation Service

2013 Ranking Period 1

Documentation Requirements

Documentation for each treatment area (field) and year of this enhancement describing these items:

1. A map showing where the activities are applied,
2. Cover crop species planted,
3. Cover crop planting date,
4. Cover crop seeding rate (bu/ac),
5. Annual crop planted,
6. Nitrogen application rates/amounts for the annual crop:
 - a. If N application rates increased, technical justification shall be provided for the increase,
 - b. If N application rates were decreased in excess of the default residual value recommended by the LGU, technical justification shall be provided for the decrease, and
7. Treatment acres.

References

Jokela, B. and M. Russelle. 2010. Perennial Forages Benefit Soils, Other Crops, & Water Quality. Forage Focus. USDA-ARS. <http://www.midwestforage.org/pdf/452.pdf.pdf>

Magdoff, F. and H. van Es. Cover Crops. 2000. *In* Building soils for better crops. 2nd ed. Sustainable Agriculture Network Handbook Series. National Agriculture Library. Beltsville, MD. pp 87-96.

Shiple, P.R., J.J. Meisinger and A.M. Decker. 1992. Conserving Residual Corn Fertilizer Nitrogen with Winter Cover Crops. *Agron. J.* 84S69-876.

Water Quality Enhancement Activity – WQL10 – *Plant an Annual Cover crop that will Scavenge Residual Nitrogen*

Reference:

- **340 – Cover Crop**
- **590 – Nutrient Management**
- [Midwest Cover Crops Council Decision Tool](#)
- [Managing Cover Crops Profitably, 3rd Edition](#)

The following annual cover crops have the growth rate and rooting depth required to scavenge excess nitrogen from the root zone of the previous crop:

Annual Ryegrass*

Barley*

Cereal Rye

Oats*

Radish*

Rapeseed (or Canola)*

Sorghum-Sudangrass

Wheat*

An estimate of the amount of N that is scavenged from each of these crops is given in the *Managing Cover Crops Profitably* book, in the write-up about each specific crop.

These are just a sample of cover crops that may apply, consult the references above for other cover crop species.

* If planted after Sept. 15, these crops will scavenge a relatively small amount of N.

Species	Full Seeding Rate	Seeding Depth (inches)	Seeding Date	Comments
Annual Ryegrass	15 – 20 lbs/ac	¼ to ½	June 1-July 1 OR Aug 15 – Sept 15	Easily established. Good for use as overseeding row crop. May be seeded after harvest.
Barley	1.5 – 2 bu/ac	½ to 1 ½	Aug 15 - Sept 15	May be overseeded into growing crop or seeded after harvest.
Oats	1 – 2 bu/ac	½ to 1 ½	Aug 15 - Sept 15.	Can be seeded on rough plowed land (usually before Sept. 1) and will not need plowing the following spring
Cereal Rye	1 – 1 ¼ bu/ac	½ to 1 ½	Aug 15 - Sept 15	Easily established. Rapid growth in fall and spring. Has an allelopathic property.
Cereal Rye	¼ - ½ bu/ac	½ to 1 ½	Aug 15 - Sept 15	Use this rate only for cropland going into sugarbeets the following spring
Radish	8 – 10 lb/acre	¼ to ½	Aug 1 – Sept 15	Rapid fall growth, potential to capture nitrogen in large amts and from deep in the profile.
Rapeseed	5 lbs/acre	¼ to ¾	Aug 1- Sept. 15	Known for rapid fall growth, biomass production and nutrient scavenging.
Winter Wheat	1- 1 ½ bu/ac	½ to 1 ½	Aug 15 - Sept 15	Advantageous if site is seeded after Sept. 1 or under dry soil conditions.
Sorghum – Sudan	25 – 30 lbs/ac	½ to 1	May 15 - July 1	Advantageous to use on well drained and droughty sites.

Please Note:

- Care is advised when determining the amount of N that will be available to the crop following the cover crop. Per acre yield in Minnesota may not be substantial depending on planting date and time of senescence or killing frost.
- The lbs. per acre yield (dried) must be calculated; the percent N in plants just before death must be figured; and the percentage that can become available to the upcoming crop must be estimated (Yield X %N X % mineralized = available N).

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3. Assume that 50% of the N in the cover crop will be available to the upcoming crop in a plow down or incorporation system and 25% will be available in a system where the cover crop residues are left on the soil surface.

4. Nutrient application rates shall be consistent with University of Minnesota or contiguous land grant university recommendations.
 - [University of Minnesota Fertilizer Recommendations for Agronomic Crops in Minnesota](#)
 - [University of Minnesota—Nutrient Management of Commercial Fruit and Vegetable Crops in Minnesota](#)
 - [University of Minnesota Commodity Crop Production Website](#)
 - [Iowa State University—A General Guide for Crop Nutrient and Limestone Recommendations in Iowa](#)
 - [South Dakota State University—Fertilizer Recommendations \(EC750 Sept. 2005\)](#)
 - [North Dakota State University—North Dakota Fertilizer Recommendation Tables and Equations \(SF-882\)](#)
 - [University of Wisconsin—Nutrient Application Guidelines for Field, Vegetable, and Fruit Crops in Wisconsin \(A2809\)](#)

5. Full Seeding Rates should be multiplied by the percent desired if mixtures are used.