



Natural Resources Conservation Service
WASHINGTON

WQL10 – Plant a cover crop that will scavenge residual nitrogen

CSP Enhancement Washington State Supplement

Land Use Applicability: Cropland

January 2014

Client/Operating Unit:

Tract Number:

Farm/Ranch Location:

Farm Number:

Specifications Date:

Field Number(s):

Planned Installation Date:

Proposed Treatment Acres:

Enhancement Description:

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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.

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 for planting a cover crop that will scavenge residual nitrogen

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.

Layout Sketch & Drawing (Provide sketch, drawings, maps, and/or aerial photographs.)

- Geo-referenced field map with all delineated treatment areas where CSP Enhancement WQL10 is to be applied.

Adoption Requirements

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

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.

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

Field Office Technical Guide:

[eFOTG, http://www.nrcs.usda.gov/technical/efotg/](http://www.nrcs.usda.gov/technical/efotg/)

* Some online documents may take several minutes to download.

State Supplemental Information

States will need to have list of approved cover crops for this and a way to estimate the amount of N that is scavenged.

Implementation of this enhancement requires:

1. The cover crop selected shall have the growth rate and rooting depth required to scavenge excess 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:
2. ***Managing Cover Crops profitably, 3rd Edition, Chart 2 Performance & Roles, pg 67.***

<http://www.sare.org/publications/covercrops/covercrops.pdf>

Example cover crops would include Non-Legumes such as annual rye, barley, oats, Wheat, Triticale, Sorghum sudan, mustards, radish, rapeseed.

Cover crop species that are Legumes are not suitable for this purpose

3. Timing of planting and seeding rates for cover crops shall follow the recommendations in the respective NRCS Field Office Technical Guide (FOTG). Washington state Planting and Seeding Guide, Plant Materials Technical Note 1.
4. The producer must have a current soil test (no more than 3 years old) that is representative of the Treatment area with consistent soil resources and crop management system.
5. 100% of the soil test estimate for available Nitrogen (NO₃ and NH₄) in the top 2 feet of the soil profile is credited as a source of available N to the cover crop. Use the WA Nutrient Management 590 conservation practice job sheet/specification as a Nutrient Budgeting tool.
6. All available field and crop specific N sources, including soil test residual, soil organic matter mineralization, etc, plus applied N shall not exceed the estimated N uptake requirement for the cover crop.
7. RUSLE2 vegetation database for the specific planned cover crop can be used to estimate Biomass yield.
8. The producer shall not increase soil surface disturbance over existing benchmark conditions.

Additional cover crop references include:

<http://www.sare.org/publications/covercrops/covercrops.pdf>

Nitrogen scavenged estimation = Biomass Yield lb/acre * % N in cover crop material

An example yield estimate of 1000 lb/acre

An example estimate for % N might be 2.5% N

Estimate N recovered would be 25 lb N/acre

** Yield estimates should include estimate for Root Biomass as well.*

The vegetation database in RUSLE2 software for specific cover crop species can be used to estimate the accumulation of Root Biomass and live above ground biomass (lbs/acre dry matter) for a selected cover crop species at 100% canopy.

The yield value you use is an estimate of the above ground biomass expected at the time of cover crop termination. This yield value in lbs/acre is used to calculate expected N uptake accomplished.

For the specific purpose of utilizing and recycling soil profile N, the Crop Nutrient Tool found in the USDA PLANTS Database is used to generate crop specific estimates of the % N in Biomass produced.

<http://plants.usda.gov/npk/main>

A good discussion of Cover crops in Washington can be found:

<http://cru.cahe.wsu.edu/CEPublications/eb1870/eb1870.pdf>

Plant material Technical notes dealing with many properties and functions of cover crops can be found in Washington NRCS, eFOTG, Section 1.

A representative soil sample following the termination of the cover crop and prior to the following crop can be used to evaluate the accuracy of the N content and biomass production estimates for the cover crop ability to scavenge residual soil Nitrogen.

Documentation Form

Producer:
 Date:
 Tracts:
 County:

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.

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|-----------------------------------------------------|--|--|--|--|--|
| Field Number(s): | | | | | |
| Cover Crop Species Planted: | | | | | |
| Cover Crop Planting Date: | | | | | |
| Seeding Rate (bu/ac): | | | | | |
| Yield Estimate: | | | | | |
| | | | | | |
| Annual Crop Planted: | | | | | |
| Nitrogen Application Rates/Amounts for Annual Crop: | | | | | |
| Treatment Acres: | | | | | |

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

- A map showing the fields and treatment acres where the activities are applied.

WSU Analytical Laboratories Database:

<http://www.puyallup.wsu.edu/analyticalabs/>

Commercial and Agricultural Resources:

<http://extension.wsu.edu/wsprs/Pages/AgResources.aspx>

Client's Acknowledgement (To be signed before the Enhancement is applied.)

By signing below, I acknowledge that I:

- have reviewed and understand the site specific design, installation specifications and operation/maintenance requirements in this State Supplemental Sheet and have an understanding of the purpose(s) of this Enhancement;
- will install, operate, and maintain this Enhancement in accordance with the National Sheet, the Washington State Supplemental Sheet and the site specific specifications.
- will make no changes to the planned design and installation without prior written approval of the Natural Resources Conservation Service.
- will obtain all necessary permits and/or rights, and comply with all ordinances and laws pertaining to the installation, operation, and maintenance of this Enhancement, prior to the start of installation; and
- will assume responsibility for notifying all Utilities affected by the installation, operation and maintenance of this Enhancement.

Signature

Date

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