NRCS

Natural Resources Conservation Service

WASHINGTON

SQL12 – – Intensive cover cropping in annual crops

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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Grow and manage *seasonal* cover crops of grasses, legumes or forbs to maintain soil coverage and other conservation benefits during all the non-crop production periods in an annual crop rotation. Intensive cover cropping is applicable to conventional, specialty and organic crop production systems.

Benefits

Using seasonal cover crops during all non-production periods between annually produced crops reduces wind and water erosion. When managed appropriately for local conditions, cover crops can restore and maintain soil productivity and soil quality over a wide range of climates and crop species. Cover crops restore and maintain soil properties by increasing organic matter, relieving compaction, improving soil tilth and fertility, fixing nitrogen (legumes), recycling nutrients in the soil profile, breaking pest cycles and providing habitat for soil biota, such as beneficial bacteria, mycorrhizal fungi and earthworms.

Conditions Where Enhancement Applies

This enhancement applies to all acres of annually planted cropland. These acres can be organic, transitioning to organic, or non-organic.

Criteria for the intensive cover cropping in annual crops

Implementation of this enhancement requires the use of cover crops to provide soil coverage during the non-crop production periods of the rotation. To minimize periods of soil exposure, plant cover crops as soon as practical after harvest of each production crop. Use cover crop species appropriate to the season and seeding as well as seeding rates and methods that will yield a uniform stand and rapid ground coverage. Cover crops may be seeded into standing production crops provided seeding rates and methods, soil moisture levels and other environmental conditions are adequate to yield a satisfactory cover crop stand.

For the purposes of this enhancement, the cover crop shall not be harvested or grazed.

Each cover crop in the rotation shall meet the criteria for a least one of the following purposes. Over the duration of the crop rotation, cover crops shall be utilized to meet two or more of the criteria.

1. High bio-mass cover crops for erosion control and increased soil organic matter improvement.

   a. Plant a cover crop with a growth potential to produce a minimum of 3,000 lbs/acre (dry weight) above ground bio-mass when terminated by seasonal temperature changes (frost or heat), mechanical action (mowing, tillage, crimping, etc.) and/or herbicides in preparation for the following crop. Use seeding rates and row spacing (for drilled cover crop) that will provide rapid canopy closure and adequate ground coverage to prevent erosion between production crops, with a minimum of 90% cover by the time of cover crop termination.

   b. Leave the entire biomass in the field (i.e., do not harvest or graze the cover crop)

   c. Growth potential lists and recommended seeding rates and methods for selected cover crops are available in "Managing Cover Crops Profitably, 3rd Edition" (Clark, 2007).

2. Legume cover crops for biological nitrogen fixation.

   a. Plant a leguminous cover crop between two primary crops in the rotation. This option does not apply to legumes that are normally part of the crop rotation. The legume shall be seeded at a rate recommended by the NRCS Field Office Technical Guide. Estimate nitrogen credits from the leguminous crop and base any additional N applications according to the guidelines of the Land Grant University, as approved by the NRCS State Agronomist.

   b. Manage legume N to minimize N loss. In climates and soils where rapid N mineralization and/or leaching are likely, plant a legume-grass mixture to increase the biomass C: N ratio. This will decrease the N release rate.

3. Non-leguminous cover crops to capture and recycle residual nitrogen.

   a. Plant a cover crop with a growth rate and rooting depth sufficient to scavenge excess/unused nitrogen remaining in the upper soil profile. Select cover crops, planting dates and seeding rates as determined or agreed to by the NRCS State Agronomist.

   b. Consider reducing the N recommendation for the following crop by an estimated amount based on the site conditions both before and during the cover crop's growing period, the cover crop species, and the termination phase of the cover crop.

Note: This option does not apply to the same acres on which a leguminous cover crop is applied.

4. Cover crops for weed suppression.

a. Plant a cover crop with the chemical and physical characteristics necessary to suppress or compete with the identified target weed species. Leave cover crop residues on the soil surface to maximize the allelopathic (chemical) and mulching (physical) effects. Select cover crops, planting dates and seeding rates as determined or agreed to by the NRCS State Agronomist.

5. Biodiversity improvement with cover crops.

   a. Plant cover crop species with the characteristics to attract beneficial insects such as pollinators and/or predator insects, serve as trap crops for damaging insects, and/or provide natural bio-fumigation for soil dwelling pests. Select cover crops, planting dates and seeding rates as determined or agreed to by the NRCS State Agronomist.

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

- Geo-referenced field map with all delineated treatment areas where CSP Enhancement SQL12 is to be applied.

Adoption Requirements

This enhancement is considered adopted when two or more of the criteria are met on land use acreage.

Documentation Requirements

1. Crop rotation records, including rotation length in years, crops and cover crops planted,
2. Sequence and description of operations for each crop and cover crop including harvest, tillage, nutrient placement and planting/seeding,
3. Photographs of representative fields showing cover crops added to the rotation, timing and method of cover crop establishment, and extent of cover crop growth just before termination, and
4. Seed and legume inoculant tags and receipts.

References*:

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

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.

Field Office Technical Guide:

eFOTG, http://www.nrcs.usda.gov/technical/efotg/

*** Some online documents may take several minutes to download.**

State Supplemental Information

States will need to be sure their cover crop recommendations are up to date and cover the five different criteria listed in the enhancement.

Cover crop mixes are grown between primary cropping seasons. Species on the county noxious weed lists will not be allowed for that county. Cover crops will not be harvested or grazed. Cover crops should be given as much growing time as possible to maximize plant growth while retaining adequate soil moisture for the subsequent crop. Low rainfall areas need to take into consideration moisture availability of the following crop and any insurance requirements producers may have for termination. Recommended termination in low rainfall is at least 60-90 days before planting of next crop. For all cover crops termination is recommended at a minimum of 2-3 weeks prior to planting of the next crop to avoid any insect or disease infestations associated with green tissue (green bridge effect). Ensure legumes used for nitrogen fixation have the appropriate Rhizobium inoculant. Cover crop mixes are highly dependent on irrigation and climate regions, consult the State Agronomist for further guidance. Possible duplicate enhancements and practices include PLT20, SQL04, ENR10, 328, or 340.

Utilize Plant Materials Technical Note 1 – Seeding Guide (*To make the best use of the Seeding Guide load it onto your desktop, see directions in box below*).

Loading and Using the Seeding Guide

The Seeding Guide is a Microsoft Access database and can be found in Washington State's **efotg** in the ***Section I/Reference Lists/Technical Notes by discipline/Plant Materials*** **folder.**

To load the Seeding Guide on your desktop:

1. Go to Section I/Reference Lists/Technical Notes by Discipline/Plant Materials folder in efotg.

2. Double click on the Seeding Guide, and then click OPEN

3. Select the Seeding Guide and then click EXTRACT. Extract the Seeding Guide to your desktop folder.

4. Go to your desktop and double click to open the Seeding Guide (PM_TN1_Seeding_Guide_113010.accdb)

5. The first time you use the Seeding Guide you will need to do the following:

   A. Click on the Microsoft Office button in the upper left hand corner.
   B. Click on "Access Options".
   C. Click on "Trust Center", select (click on) "Trust Center Settings".
   D. Click on Macro Settings and select "Enable all Macros"
   E. Close, then reopen the Seeding Guide.

With a click of the mouse you will have access to seed mixtures and plant data.

Documentation Form

Producer: **Date:**

Tracts: **County:**

Documentation for each field where this enhancement is applied:

1. Crop rotation records, including rotation length in years, crops and cover crops planted,

2. Sequence and description of operations for each crop and cover crop including harvest, tillage, nutrient placement and planting/seeding,

3. Photographs of representative fields showing cover crops added to the rotation, timing and method of cover crop establishment, and extent of cover crop growth just before termination, and

4. Seed and legume inoculant tags and receipts.

Field	Crop/Cover Crop	Species Mix	Planting Method	Seeding Date	Seeding Rate

List of all farming operations & Dates for farming operations

Field	Date	Farming Operations	Fertilizer Inputs (Lbs. per Acre)

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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