NRCS

Natural Resources Conservation Service

WASHINGTON

PLT19 – Herbicide resistant weed management

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: Table of Contents

Adoption of multiple agronomic principles to manage herbicide resistant weeds in annually planted crop fields.

Benefits

The number of weed species becoming herbicide resistant is increasing at an alarming rate and other weed species are evolving to possibly become resistant. Without a comprehensive management strategy to control the weeds that have already become herbicide resistant and to mitigate the evolution of potentially resistant weeds, many acres of conservation tilled land may be converted back to conventional tillage. This conversion will reverse the gains achieved over the years by conservation tillage leading to diminished soil health and greater erosion rates. By implementing this enhancement, the identified resource concerns (i.e., soil quality, soil erosion, plants and water quality) will be improved and sustained at a high level by the recommended management system.

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 herbicide resistant weed management

1. Develop a crop rotation for each enrolled acre that prevents back to back growing seasons of the same or similar crops on the enrolled acre, or crops grown back to back that utilized the same herbicide chemistry for weed control. If the current crop rotation only contains two crops, an additional crop different from the original two must be added. Exceptions to the crops grown back to back limitation: crops grown using flooded conditions for weed control (i.e., rice, lotus or taro) or new crop rotations developed as a result of this enhancement that utilize a sod base rotation.

2. The crop rotation developed as a result of Criteria #1 must be grown in a manner to maintain a Soil Tillage Intensity Rating (STIR) as determined by RUSLE2 that is lower than the previous rotation/system.

3. Develop a herbicide rotation for each enrolled acre that avoids repeated use of herbicides with the same mode of action (MOA). The same herbicide used independently shall not be used in more than two consecutive applications (i.e., two split applications in a growing season, or two consecutive single applications in two years). An herbicide with the same MOA may be used in tank mixed, prepackaged, or sequential mixtures that include multiple MOAs with substantial control of the potentially resistant weed(s).

4. When herbicides are used for weed control, a pre-plant residual shall be used with any pre- plant burn down herbicide used. Residuals shall be also be used with post-plant burn downs, early post-emerge applications and lay-by applications.

5. Scout the enrolled acreage to facilitate early weed identification, weed mapping of the problems areas, and a more timely response to weed pressures.

6. In the event of herbicide resistant weed escapes on the enrolled acres pre-harvest but after lay-by treatments, hand weed or hoe the escaped weeds prior to flowering.

7. For organic or transitioning to organic systems where a plant ecotype becomes resistant to a NOP approved herbicide, hand weeding or hoeing of the enrolled acres at least 3 times during the growing season shall be accomplished before the weeds reach maturity (i.e., flowering).

8. Post-harvest, where fields will be temporarily fallow and adequate growing conditions exist for weed growth (i.e., pre-frost), the fields shall be mechanically (this does not include tillage) or chemically treated to prevent adding seed to the weed seed bank and weed spread.

Note: If the use of a high residue cover crop or mixtures of high residue cover crops is desired as an additional management option for weed management, refer to “PLT20-High Residue Cover Crop or Mixtures of High Residue Cover Crops for Weed Suppression and Soil Heath.” This enhancement and PLT20 are complementary.

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

- Geo-referenced field map with all delineated treatment areas where CSP Enhancement PLT19 is to be applied.

Adoption Requirements

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

Documentation Requirements

Written documentation for each year of this enhancement describing the following items:

1. Crop rotation
2. Crop planting system used to manage residue
3. Scouting reports
4. Herbicides used- their MOA and date of application
5. Dates of hand weeding or hoeing, if applicable
6. Dates of post-harvest chemical or mechanical treatment, if applicable

References*:

Boerboom, C., and M. Owen. 2006. Facts about Glyphosate-Resistant Weeds. The Glyphosate, Weeds, and Crop Series. GWC-1. Purdue University.

Campbell, J., C. Mallory-Smith, A. Hulting, and D. Thill. 2011. Herbicide-Resistant Weeds and Their Management. PNW 437. University of Idaho.

Gunsolus, J.L. 2008. Herbicide Resistant Weeds. University of Minnesota-Extension. WW-06077.

http://www.extension. Umn.edu/distribution/cropsystems/dc6077.html.

Price, A.J., K.S. Balkcom, L.M. Duzy and J.A. Keltron. 2012. Herbicide and Cover Crop Residue Integration for Amaranthus Control in Conservation Agriculture Cotton and Implications for Resistance Management. Weed Technology. In press.

Price, A.J., K.S. Balkcom, R.L. Raper, C.D. Monks, R.M. Barentine, and K.V. Iversen. 2008. Controlling Glyphosate-Resistant Pigweed in Conservation Tillage Cotton Systems. Conservation Systems Research. Special Publication No. 09. USDA-ARS-NSDL, Auburn, AL.

Sustainable Agriculture Research and Education (SARE). 2010. Managing Cover Crops Profitably. 3rd ed. Handbook #9. College Park, MD.

Whitaker, J.R., A.C. York, D.L. Jordan, A.S. Culpepper, and L.M. Sosnoskie. 2011. Residual Herbicides for Palmer Amaranth Control. The Journal of Cotton Science. 15:89-99.

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 list of suitable and typical crop rotations with STIR values; and MOAs for typical herbicides.

All chemical recommendations or rates wll be computed by a State Certified Crop Consultant. NRCS will not make any chemical recommendations. For this enhancement, anually planted cropland will include land farmed under a small grain-Fallow rotation. RUSLE2 will be used to determine the STIR rating for the benckmark and planned rotation changes.

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:** ____________________

Written documentation for each year of this enhancement describing the following items:

1. **Crop rotation**
2. **Crop planting system used to manage residue**

Field(s)	Crop Rotation	Weed Management Techniques (Biological, Mechanical, Chemical)

4. Herbicides used- their MOA and date of application

Field(s)	Herbicides Used	Mode of Action & Group Number	Date of Application

5. List of all farming operations and inputs

Field	Date	Potential Ground Disturbing Farming Operations

6. STIR value for rotation

Benchmark	Planned
98	**14**

7. Scouting reports

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**