United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E328I

CONSERVATION STEWARDSHIP PROGRAM

Forage harvest to reduce water quality impacts by utilization of excess soil nutrients

Conservation Practice 328: Conservation Crop Rotation

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial)

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Establish a forage crop (single species or mix) following a primary annual crop to take up excess soil nutrients. Select forage known to effectively utilize and scavenge nutrients. Forage shall be harvested for forage, but not be grazed or burned.

Criteria

- This enhancement is applicable on fields where excess soil nutrients cause or increase water quality degradation concerns. Presence of excess nutrients must be identified in recent soil tests or increased risk to water quality documented by risk assessment tool. **(Refer to state specific guidance of options to maximize nutrient uptake in local climate and cropping systems)**

- Forage species, seedbed preparation, seeding rates, seeding dates, seeding depths, fertility requirements, and planting methods will be consistent with applicable local criteria and soil/site conditions. **(Refer to state specific lists of forage crops known to effectively utilize and scavenge nutrients)**

- Select forage crop (single species or mix of two or more species) and planting dates which will not compete with the other crop(s) yield or harvest. ***If legumes are part of the forage mix, consider that this may add nutrients to the system.***

- Select forage crop that is compatible with other components of the crop rotation and for its ability to efficiently scavenge and utilize excess soil nutrients, specifically nitrogen or phosphorous, whichever is identified as a potential risk to water quality. Nutrient uptake only occurs when a crop is actively growing. Therefore, it is imperative that the crops in rotation be planted as soon as possible after forage crop harvest (hay/balage/haylage/etc.) to maximize nutrient cycling and minimize offsite transport of nutrients.

- Determine method and timing of forage crop harvest to meet client objectives. Harvest the forage crop as late as practical to maximize plant biomass production and nutrient uptake.

- Ensure any herbicides used in the crop rotation are compatible with forage crop selections.

- Do not burn forage or residue.

- Do not graze forage crop.

- Reduce or maintain soil erosion from water and wind to below soil tolerance (T) level (average annual soil loss).

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide NRCS with the current and planned crop rotation and field operation(s) used for each crop. *See Washington State Guidance.

Document excess nutrients identified in soil tests. *Soil tests should be taken as close to production crop harvest as possible.*

Field	Soil Test Date	Nutrient (Nitrogen or Phosphorus)	Soil Test Nutrient Result (ppm or lbs/ac)

Current Management Rotation

Field	Current Crops (in sequence)	Planting Date	Harvest Date

Current Field Operations for Each Crop

Field	Crop	Field Operation	Timing of Field Operation (month/year)

Planned Management Rotation including Forage Crop

Field	Planned Crops/Forage Crop (in sequence)	Planting Date	Harvest Date

Planned Field Operations for Each Crop

Field	Crop	Field Operation	Timing of Field Operation (month/year)

Planned Forage Crop and Seeding Rate *(forage crop may be single species or mix of two or more species)*

Species	Variety	Seed Size	Typical Seeding Depth	Seeding Rate (PLS lbs/acre)	Percent of Mix (%)

Forage Crop Establishment and Management Considerations:

- ☐ Establish forage crop mix as soon as practical prior to or after harvest of the production crop.
- ☐ During implementation, forage crop must not be grazed or burned.
- ☐ During implementation, notify NRCS of any planned changes in forage crop mix or crop rotation, or management to verify the planned system meets the enhancement criteria.

☐ After implementation, if changes were made, update the tables above to document the applied crop rotation for the contract period and provide to NRCS.

After implementation, complete the table below and provide to NRCS

Task	Provide information and details
Seedbed Preparation	
Seeding Date	
Seeding Depth	
Seeding Method	
Fertilizer, as needed	
Weed Management, as needed	
Harvest Date (window)	
Harvest Method	

NRCS will:

☐ As needed, provide technical assistance in selecting forage crop for the crop rotation or substitute species that would meet the criteria of the enhancement. Forage crop may consist of a single species or mix of two or more species.

☐ As needed, provide additional assistance to the participant as requested.

☐ Prior to implementation, verify the enhancement is being planned on fields where excess soil nutrients cause or increase water quality degradation concerns. Presence of excess nutrients must be identified in recent soil tests or increased risk to water quality documented by risk assessment tool. **<REFER TO STATE SPECIFIC GUIDANCE>**

☐ Prior to implementation, use information provided from the participant to calculate the average annual soil erosion value (water and wind) for each field using NRCS erosion prediction technologies.

Benchmark Management Soil Loss = _____ tons/acre/year

Planned Management Soil Loss = _____ tons/acre/year

☐ During implementation, evaluate any planned changes in forage crop selected, timing in crop rotation, management, or field operations to verify the new system meets the enhancement criteria.

☐ After implementation, if there were any changes to planned rotation or management evaluate the applied crop rotation using information provided from the participant to calculate average annual erosion value to document that the applied rotation meets the enhancement criteria.

Applied Management Soil Loss = _____ tons/acre/year

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

WASHINGTON SUPPLEMENT TO CONSERVATION ENHANCEMENT ACTIVITY E328I

CONSERVATION STEWARDSHIP PROGRAM

Additional Criteria for Washington

- In additon to the criteria specified in the National job sheet E328I thefollowing additional criteria apply in Washington:

    1. Obtain a Pre-obligation soil test prior to including this enhancement in a Conservation Stewardship Program (CSP) contract. [For the purposes of this enhancement, a soil test must be no older than 1 year from the date of the CSP ranking deadline.]

    2. In Washington, soils that are considered to have increased risk to water have soil test values as follows:

Soil Test Values for Nitrate (NO_3)	
Sample Depth (inches)	**Soil Test Value**
0” – 12”	> or = 20 ppm
12” – 24”	> or = 10 ppm

Soil Test Values for Phosphorus (P)	
Soil Test Extraction Method	**Soil Test Value**
Olsen ($NaHCO_3$)	> or = 40 ppm
Bray (NH_4F, HCl)	> or = 70 ppm
Morgan (NaOAC)	> or = 7 ppm

3. If soil test values exceed any one of the values listed above, the soils are considered to be high risk and this enhancement is applicable as long as all other national and state criteria can be met.

4. Obtain an additional soil test for each year a forage crop is planned in the rotation as close to the previous year's annual production crop harvest as possible.

5. Limit all organic and/or inorganic nutrient applications to Land Grant University fertilizer guide recommended rates for N, P, and K for all crops in the conservation crop rotation.

6. For Washington state specific lists of forage species, seedbed preparation, seeding rates, seeding dates, seeding depths, and planting methods see Washington NRCS Plant Materials Technical Notes #6, #7, #14, and #18. Forages selected best for nutrient uptake need to be backed by Land Grant University documentation or approval by area or state technical staff. These Tech Notes can be found at: https://www.nrcs.usda.gov/wps/portal/nrcs/publications/plantmaterials/pmc/west/wapmc/pub/.

7. For Washington State specific cover crop recommendations see the Pacific Northwest Cover Crop Selection Tool at https://www.nrcs.usda.gov/wps/portal/nrcs/detail/plantmaterials/technical/toolsdata/plant/?cid=nrcseprd894840.

Additional Documentation Requirements for Washington

CONSERVATION STEWARDSHIP PROGRAM

- In addition to the documentation requirements specified in the National job sheet E328I the following additional documentation requirements apply in Washington:

    1. Prior to implementation, review documentation to verify a record of implementing Conservation Crop Rotation, meeting all NRCS CPS 328, Conservation Crop Rotation, general criteria. Verify reocrds of existing Conservation Crop Rotation Implementation

    2. Document Crop removal rates for all crops used in the planned and applied crop rotation using the crop removal rates tab of the Washington 590 Nutrient Management Budget spreadsheet. A copy of this spreadsheet can be found in section 4 of the Washington NRCS Field Office Technical Guide (FOTG).