



## CONSERVATION ENHANCEMENT ACTIVITY

E328P

## CONSERVATION STEWARDSHIP PROGRAM

### Low Nitrogen Requirement Annual Crop Rotation

**CONSERVATION PRACTICE: 328 - Conservation Crop Rotation**

**APPLICABLE LAND USE: Crop (Annual & Mixed)**

**RESOURCE CONCERN: Soil, Water**

**ENHANCEMENT LIFE SPAN: 1 years**

#### Enhancement Description

Design a planned annual crop rotation which requires less average annual nitrogen fertilizer than the current (benchmark) crop rotation. This is accomplished by replacing high N-requirement annual crops with low N-requirement annual crops. Examples include replacing high N-requirement small grain crops such as spring wheat, with low N-requirement small grain crops (oats or malt barley) or annual legumes. The crop rotation will reduce fertilizer N application, decrease the potential for nitrates to leach to groundwater, maintain soil organic matter, and slow the effects of soil acidification.

#### Criteria

- Both the benchmark and planned rotation will be grown in a planned sequence and must have a minimum of two different crops. A cover crop is considered a different crop.
- The planned crop rotation must produce a Soil Conditioning Index (SCI) value of greater than or equal to zero, as calculated by the current NRCS wind and water erosion prediction technologies.
- Sufficient residues must be left on the soil surface to prevent potential erosion issues. Use the current NRCS wind and water erosion prediction technologies to calculate residue requirements.



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- Use Land Grant University guidance and average county crop yields for the past 5 years to determine the N-requirement of each crop in both the benchmark and planned rotations.
- Design the crop sequence to provide sufficient diversity in plant family and species as well as timing and type of field operations to suppress pest(s) of concern, which may include weeds, insects, and pathogens. Use Land Grant University or industry standards to determine a suitable crop sequence.
- Select crops, varieties of crops, and the sequences of crops based on local climate patterns, soil conditions and irrigation water availability. Plan for rotation substitutions, for planting delays, or crop failures.
- Perennials are allowed in both the benchmark and planned rotation; however, they cannot be included in the average annual N-requirement calculation to meet the enhancement criteria.
- Fallow periods are allowed in both the benchmark and planned rotation; however, they cannot be included in the average annual N-requirement calculation to meet the enhancement criteria.

### Documentation and Implementation Requirements

#### **Participant will:**

- Provide NRCS with the current (benchmark) and a suggested planned annual crop rotation.
- During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

#### **NRCS will:**

- As needed, provide technical assistance in selecting crop rotations or substitute crops that would meet the criteria of the enhancement.
- Calculate the 5-year average county yield for each crop in both the benchmark and planned rotation. If this information is not available, consult with LGU personnel to make an informed decision.



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- Calculate the average annual LGU nitrogen requirement for the benchmark and planned rotations based on the crops and their 5-year county yield averages. Fill in the tables below with this information.
- Verify that the average annual nitrogen requirement of the planned rotation is less than the average annual nitrogen requirement of the benchmark rotation.
- Prior to implementation, verify that both the benchmark and planned crop rotation include at least two different crops.
- Prior to implementation, use the information provided from the participant to calculate the average annual erosion and Soil Conditioning Index (SCI) using current NRCS wind and water erosion prediction technologies. The planned crop rotation must produce an SCI value of greater than or equal to 0, and the average annual erosion must be at or below T.

Average Annual Erosion (ton/ac/yr) = \_\_\_\_\_ SCI value = \_\_\_\_\_

### Benchmark Rotation and N Requirement

Field: \_\_\_\_\_ Acres: \_\_\_\_\_

Current Annual Crops (in sequence) (Do not include fallow or perennial crops)	5-year County Average Yield	LGU Nitrogen Requirement (lb/ac)
<b>Total Rotation N Requirement</b>		
<b>AVERAGE ANNUAL N REQUIREMENT (Total/Rotation Years)</b>		



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## Planned Rotation and N Requirement

Field: \_\_\_\_\_ Acres: \_\_\_\_\_

Planned Annual Crops (in sequence) (Do not include fallow or perennial crops)	5-year County Average Yield	LGU Nitrogen Requirement (lb/ac)
<b>Total Rotation N Requirement</b>		
<b>AVERAGE ANNUAL N REQUIREMENT (Total/Rotation Years)</b>		

- During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- After implementation, if the applied crop rotation is different than the planned crop rotation, use the information provided from the participant to re-calculate the average annual N requirement, average annual erosion, and SCI values to document that the applied rotation met the enhancement criteria.

Re-calculated Average Annual Erosion (ton/ac/yr) = \_\_\_\_\_ SCI value = \_\_\_\_\_

### 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



## OREGON SUPPLEMENT TO CONSERVATION ENHANCEMENT

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#### Clarification of criteria for perennial crops:

The IR states:

- *Perennials are allowed in both the benchmark and planned rotation; however, they cannot be included in the average annual N-requirement calculation to meet the enhancement criteria.*

While perennials are allowed in the crop rotations, this enhancement is specifically focusing on ANNUAL crops with lower nitrogen requirements, thus the nitrogen amounts for perennial crops cannot be included into the calculation of average annual nitrogen requirement. The average annual nitrogen requirement is only for annual crops.

#### References for county average crop yields:

- County extension agent
- LGU publications
- USDA National Agricultural Statistics Service
  - [https://www.nass.usda.gov/Statistics\\_by\\_State/Oregon/Publications/Field\\_Crop\\_Report/index.php](https://www.nass.usda.gov/Statistics_by_State/Oregon/Publications/Field_Crop_Report/index.php)
- Oregon Grass and Legume Seed Production
  - <https://cropandsoil.oregonstate.edu/seed-crops/oregon-grass-and-legume-seed-production>
- If crop yields are not available by county, utilize state data
- If no yield information is available, contact the State Agronomist