

Energy Enhancement Activity – ENR10 – Using nitrogen provided by legumes, animal manure and compost to supply 90 to 100% of the nitrogen needs



Enhancement Description

This enhancement involves using nitrogen (N) produced by legumes and/or available animal manure and compost to supply 90 to 100% of N nutrient needs for crops, hay and/or forages produced on the farm.

Land Use Applicability

Cropland, Pastureland

Benefits

Annually 12 million tons of N fertilizers are used to produce crops on over 90 million acres. It requires 35,000 to 40,000 cu. ft. of natural gas to produce one ton of N fertilizer accounting for 1/3 of the energy input to crop production. Managing legumes, manures and compost properly can replace the need for additional N fertilizer and reduce the energy footprint of the farming operation.

Conditions Where Enhancement Applies

This enhancement applies to all crop or pasture land use acres.

Criteria

1. Follow a nutrient management system that utilizes N from legumes, animal manures, composts and the mineralization of N from soil organic matter decomposition to supply 90 to 100% of the N needs for production.
2. Follow recommendations from the Land Grant University (LGU) for legume N production when estimating available N for crop production. Note: For a more accurate estimate, utilize the guidance in “Northeast Cover Crop Handbook” chapter 2.
3. Utilize manure and compost nutrient analysis conducted by a LGU laboratory or a private commercial lab recognized by the state when estimating available nutrients for crop production.
4. Manure must be applied according NRCS Nutrient Management Conservation Practice Standard (590). Contact your local conservationist for assistance with Conservation Practice Standards.
5. Utilize cover crops to trap N where appropriate (e.g., following manure application on soils with low residue levels, on soils that have been tilled, or where the fall manure applications were made for a spring planted crop).
6. Manure from off farm sources can be used. The total amount of phosphorus applied shall not exceed the rate recommended by the LGU based on soil testing and established yield goals.



- This enhancement does not include the removal of crops that require nitrogen from the rotation (e.g., eliminating corn to avoid use of nitrogen fertilizer). However, diversifying the crop rotation to alternate N-requiring with N-fixing crops to reduce the frequency of N-requiring crops in the rotation is acceptable.

Adoption Requirements

This enhancement is considered adopted when 90 to 100% of the nutrient N needs for the crops, hay or forages produced on the farm are from organic sources.

Documentation Requirements

Crop production records that include:

- Source of organic nitrogen (e.g., cover crop, manure, and compost)
- An estimate of available nitrogen and methods used to estimate N including:
 - Lab analysis
 - Biomass calculation
- Soil test results for each treatment area
- Amount of manure and/or compost applied per acre
- Manure and compost nutrient analysis (if applicable)
- Amount of nitrogen, phosphorus and potassium applied as manure and/or compost (if applicable)
- List of fields where enhancement was applied each year
- Estimate of legume biomass produce each year (if applicable)

References

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

Magdoff, F. and H. van Es. Cover Crops. 2000. p. 87-96 *In* Building soils for better crops. 2nd Ed. Sustainable Agriculture Network Handbook Series; bk 4. National Agriculture Library. Beltsville, MD.

USDA-NRCS, 2014. NRCS Cover Crop Termination Guidelines. Version 3

Utah State Supplement 2015 for ENR10

Notes:

- Corn or small grain in a rotation of alfalfa will produce well without additional N application. <http://digitalcommons.usu.edu/etd/2342/>
- Manure tests and soil tests from USU Analytical lab are acceptable <http://www.usual.usu.edu/about/faq/>

| Enhancement Name | Enhancement Code | Potential Duplicative Practices (code) | Incompatible Enhancements |
|--|------------------|---|--|
| Using nitrogen provided by legumes, animal manure and compost to supply 90 to 100% of the nitrogen needs | ENR10 | 340 - Cover Crops (soil quality) 590 - Nutrient Management | AIR08 ANM21 ENR12 WQL07 WQL24 WQL25 SQL11 |



United States Department of Agriculture
Natural Resources Conservation Service

2016 - 1
2017 - 1 Renewal

Operations & Maintenance, Conservation Measures, and Client Acknowledgement

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| Operation and Maintenance | |
| Operation: | |
| Maintenance: | |
| Conservation Measures | |
| Actions that must be implemented by the landowner/manager during practice implementation: | |
| Client's Acknowledgement Statement | |
| The Client acknowledges that: | |
| a. They have received a copy of the enhancement and understand the contents and requirements. | |
| b. It shall be the responsibility of the client to obtain all necessary permits and/or rights, and to comply with all ordinances and laws pertaining to the application of this practice. | |
| Cooperator: | Date: _____ |
| _____ | |
| Planner: | Date: |
| _____ | |