

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

Crop, Pasture

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.



7. 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

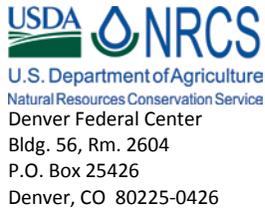
Crop production records that include:

1. Source of organic nitrogen (e.g., cover crop, manure, and compost)
2. An estimate of available nitrogen and methods used to estimate N including:
 - a. Lab analysis
 - b. Biomass calculation
3. Soil test results for each treatment area
4. Amount of manure and/or compost applied per acre
5. Manure and compost nutrient analysis (if applicable)
6. Amount of nitrogen, phosphorus and potassium applied as manure and/or compost (if applicable)
7. List of fields where enhancement was applied each year
8. 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.



Colorado Supplement

to

National CSP 2014 Enhancement Activity Job Sheet: ENR10

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Criterion #2

Legume nitrogen credits

For alfalfa, sweet clover and red clover, estimate nitrogen credits based on the Nitrogen Credits for Previous Crops table included in the Colorado [Nutrient Management 590 Job Sheet](#).

For other legumes, follow the procedures outlined in Managing Cover Crops Profitably, 3rd Ed., pages 22 and 23, to estimate nitrogen credits. (<http://www.sare.org/Learning-Center/Books/Managing-Cover-Crops-Profitably-3rd-Edition>)

or,

Refer to [Pacific Northwest Extension Publication 636](#), November 2012, to estimate plant available nitrogen release from the cover crop.

Criterion #3

Acceptable manure testing labs are those that meet the requirements of the [Minnesota Department of Agriculture, Certified Manure Testing Labs Program](#).

Criterion #4

Develop a nutrient management plan that is consistent with Colorado [Nutrient Management 590](#) planning criteria, and record the plan in a Colorado [Nutrient Management 590 Job Sheet](#).

Annual soil and organic nutrient sampling and analysis is required for systems that receive organic nutrient applications such as compost and manure.

Acceptable soil test labs are those that meet the requirements of the [North American Proficiency Testing Program – Performance Assessment Program](#) (NAPT-PAP).

Acceptable manure testing labs are those that meet the requirements of the [Minnesota Department of Agriculture, Certified Manure Testing Labs Program](#)

Completion of a [Colorado Nitrogen Leaching Index Risk Assessment](#) is required for each field and soil test cycle unless the Preliminary Nitrogen Leaching Risk Screening Tool indicates that a risk assessment is not necessary.

Completion of a [Colorado Phosphorus Index Risk Assessment](#) is required for each field and soil test cycle when any of the following conditions apply.

- The planned phosphorus (P₂O₅) application rate exceeds CSU fertility recommendation for the planned crop and realistic yield goal, or
- The site is located within a phosphorus- impaired watershed (contributes to 303d-listed water bodies), or
- The Preliminary Phosphorus Risk Screening Tool directs the planner to complete a Phosphorus Index Risk Assessment.

Criterion #5

Develop planned cover crops including seed rates and planting and kill dates, in a Colorado [Cover Crop 340 Job Sheet](#).

For dryland cropping systems, planned cover crop termination dates must be consistent with [NRCS Cover Crop Termination Guidelines, Version 2, December 2013](#).

For irrigated cropping systems, the system including cover crops must be compatible with any site-specific consumptive use limitations.

Additional Documentation Requirements

Provide completed copies of the following to certify practice application, as applicable.

Nutrient Management 590 Job Sheet including soil and manure sample analyses and required risk assessments for N leaching and P runoff

Cover Crop 340 Job Sheet, as applicable.