

Water Quality Enhancement Activity – WQL16– Use of Legume Cover Crops as a Nitrogen Source



Enhancement Description

This enhancement is for the use of legume cover crops as a primary source of nitrogen in a cropping system. Use of legume cover crops is applicable to conventional, specialty and organic crop production systems.

Land Use Applicability

This enhancement is applicable to cropland.

Benefits

Approximately 35,000 cu ft natural gas is required to produce one ton of nitrogen fertilizer. Legume cover crops can provide 50 to 100 lbs of plant available nitrogen per acre to reduce off-farm energy requirements.

Criteria

- Plant and manage legume cover crops prior to all field or specialty crops raised that require the use of commercial nitrogen.
- Estimate nitrogen credits from the leguminous crop. The legume cover crop must be selected and managed to supply at least 75 lbs of N. Nitrogen credit estimate should consider:
 - The amount of biomass produced (plant height and maturity)
 - The nutrient composition of the cover crop (for example, clover vs. vetch)
 - The decomposition rate of the cover crop during the cash crop growing season based on incorporation of the residue or being left on the soil surface after planting. Note: An example procedure is outlined in “*Managing Cover Crops Profitably, 3rd Edition*” (Sarrantonio, 1998)
- Determine additional nitrogen application rates based on guidelines of the state Land Grant University. Nitrogen application rates must be reduced by at least 75 lbs. to account for the nitrogen available from the legume cover crop.

Documentation Requirements

1. Written documentation for each year of this enhancement describing the following items:
 - Type of legume cover crop planted
 - Calculations for estimating available nitrogen
 - Application rates of additional nitrogen by field
 - Realistic yield goals for field or specialty crop grown
2. A map showing where the enhancement is applied



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Reference:

- **340 – Cover Crop**
- **590 – Nutrient Management**

Species	Seeding Rate	Seeding Depth (inches)	Seeding Date	Comments
Berseem Clover	10 – 15 lbs/ac	¼ to ½	Early spring into small grain.	Summer annual. Often mixed with ryegrass or small grains. Heavy N producer, establishes well with an oat nurse crop – excellent cover for sg-c-sb rotations. Winter kills.
Cowpeas	30 – 90 lbs/Ac	1 to 2	May 15 - July 1	Summer annual adapted to southern MN. Often mixed with sorghum-sudangrass or interseeded with corn.
Crimson Clover	10 – 15 lbs/ac	¼ to ½	Early spring into small grain OR Aug 1 - Sept 15	Adapted to southern MN; rapid summer or fall growth; use as a winter killed annual like oats. Provides good groundcover and weed control.
Hairy Vetch	20 – 30 lbs/ac	½ to 1 ½	Aug 1 - Sept 15	Adapted to southern MN; produces plenty of residues to condition soil and supply N. It can provide sufficient N for many vegetable and late planted crops and partially replace N for corn. Smothers spring weeds. Commonly planted with winter cereals.
Medium Red Clover	8 – 10 lbs/ac	¼ to ½	April 15 - June 15 OR Aug 1 - Sept 15	Good on somewhat poorly drained sites and potato fields with moderate pH. Prefers drilling to broadcast.

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Sweet Clover	8 – 10 lbs/ac	¼ to ½	Early spring into small grain OR Aug 1 - Sept 15	Advantageous to use on well drained and droughty sites. Prefers drilling to broadcast. May become invasive if allowed to seed out. Hard seed will remain viable in soil for many years.
White Clover	5 – 7 lbs/ac	¼ to ½	Aug 1 - Sept 15	Often mixed with annual rye or red clover. Good when planted between rows of irrigated vegetables or trees.

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