Animal Enhancement Activity – ANM03 - Incorporate native grasses and/or legumes to 15% or more of herbage dry matter productivity

Enhancement Description
Improve pasture by increasing native grasses and/or legumes to 15% of herbage dry matter (productivity by weight) using adapted species and varieties, appropriate seeding rates, and timing of seeding. Pastures containing about 15% native grasses and/or legumes by weight dry matter are approximately equal to 30% foliar cover.

Land Use Applicability
Pastureland

Benefits
Enhancing existing pasture by incorporating native grasses and legumes can provide:

1. Improved forage quality and quantity
2. Improved soil fertility (legumes fix nitrogen in the soil), increase organic matter
3. Increased plant diversity and promote wildlife habitat
4. Additional forage during seasonal slump periods
5. Extended grazing season
6. Food source for pollinating insects

Conditions Where Enhancement Applies
This enhancement only applies to acres of pasture land use that DO NOT currently have a mixed stand of native grasses and/or legumes.

Criteria
A written grazing management plan that outlines specific goals and objectives, including:

1. Utilize adapted species, seeding rates and seeding dates according to local NRCS practice standards.
2. Determine species composition before and after seeding. Species composition must be 15% or more of native grasses and/or legumes.
3. If legumes are incorporated, a current soil test is required. Apply lime and fertilizer to facilitate establishment and persistence of legumes as required by the current soil test report.
4. Livestock stocking rates that will allow for proper forage utilization.

Note: Bloat can be a risk to grazing livestock where legumes make up greater than 50% of the total forage. Legumes with the highest likelihood to cause bloat include white clover, alfalfa, annual medics and Persian clover. Red clover, crimson clover and subterranean clover would be classified as moderately likely to cause bloat, while berseem clover and arrrowleaf clover are

low risks for causing bloat. Legumes that don't cause bloat are birdsfoot trefoil, sainfoin and crownvetch. Livestock producers grazing alfalfa aftermath in the fall months should be cautioned of bloat, especially following a killing frost. The recommendation for grazing frost killed alfalfa is to wait 5 to 7 days after the killing frost (less than 28 degrees Fahrenheit) before grazing. This will allow the live tissue to fully break down, minimizing the soluble leaf proteins, and making a much safer feed base for ruminant livestock. If bloat is a concern, there are several precautions that can be taken. (A technical reference sheet will be available to address these issues).

Adoption Requirements

This enhancement is considered adopted when the subject pasture acre(s) contain 30% or more foliar coverage of native grasses and/or legumes.

Documentation Requirements

1. A written planting specifications plan identifying:
   a. Plant species' to be seeded,
   b. Seeding rates and dates,
   c. Site preparations and planting method, and
   d. Amounts of fertilizer and lime to be applied.
2. Map showing locations were seeding activity is applied.
3. Copy of the grazing management plan

Plant Enhancement Activity – *ANM03 – Incorporate Native Grasses and/or Legumes into 15% or more of the forage base*

Reference: 512 – Forage and Biomass Planting, Technical Note 1

General Recommendations

Sucessful interseeding of legumes into existing cool season pastures will be enhanced by following the recommendations below. ***Interseeding warm season native grasses into existing cool season grass pastures has had a very low success rate in Minnesota and should be avoided. If warm season grasses will be added to an existing cool season forage base, success will be greatly improved if the area is completely reseeded.***

Variety Selection

Use varieties from the University of Minnesota list of recommended varieties, Plant Materials Center varietal selections, or University recommended varieties from states adjacent to Minnesota. Other varieties that are adapted to Minnesota and listed as recommended in the Extension publications of states adjacent to Minnesota are acceptable. From these sources select varieties that:

- have resistance for insects or diseases that may be present,
- that match the harvest schedule and method of the producer,
- match the intended livestock species, class, and utilization method,
- are adapted to climatic and microclimatic conditions in the area to be seeded
- fit the method of biomass utilization if applicable

Some seed tags list "Variety Not Stated". These will not be considered as counting toward the total number of pure live seeds per square foot when they originate outside of the States of Minnesota, Wisconsin, North Dakota, South Dakota, and Iowa. Exceptions to this may be given on a case by case basis by the Area Resource Conservationist or the Area Grazing Specialist.

Legumes

Use pre-innoculated legume seed with the rhyzobia species specific to the legume(s) in the seed mix. If there are two kinds of legumes, each one will be inoculated with its specific rhyzobia species.

Legumes will have hard seed, seeds that do not germinate during the first year, and the amount of hard seed will be specified on the seed tag. If there are more than 20% hard seed adjust the seeding rate up to achieve the desired pure, live seed coverage. Do not recommend seeding alfalfa following alfalfa due to problems with autotoxicity. Pasture mixes should not contain more than 50% legumes on a pure live seed basis to avoid bloat in livestock.

Potentially Invasive Species

Ask for prior approval from the Area Resource Conservationist or Grazing Specialist before recommending reed canarygrass, birdsfoot trefoil, crested wheatgrass, or smooth bromegrass. These may be considered invasive if adjacent to restored native warm season grass stands or prairie remnants.

Interseeding no-till into existing stands

Before planting the new seed, the existing species must be suppressed. In the summer and fall before seeding, graze heavily or clip to a height of one inch or in the spring apply a burn down herbicide at a suppression rate just prior to seeding when the existing plants reach about 4 inches in height. Use a no-till drill to seed into the sod at depth of ¼ to ½ inch. It is better to seed when the soil is slightly moist but not wet, especially when seeding inoculated legumes. Adjust the coulters and packing wheels of the drill to cover the seed based on the soil texture, moisture, and condition of the surface residue. Do not recommend interseeding alfalfa into existing alfalfa stands due to autotoxicity.

Periodic flash grazing during the establishment year is essential to controlling competition of existing grasses with the new seeding. Test to see if the young seedlings can be easily pulled out by hand before turning livestock in. The soil must be settled enough and moisture content low enough so that the young seedlings aren't easily pulled out by the animals grazing.

Control perennial and biennial broadleaf weeds with appropriate herbicide the year before sod seeding. (Organic producers will not have this option available to them.) Complete control often requires more than one application. **Some broadleaf herbicides can have residual effects lasting several years, please be aware of these herbicides and how**

they will affect your planning. Refer to the MN NRCS Conservation practice standard 595 Pest Management and University of Minnesota Extension website http://appliedweeds.cfans.umn.edu/. **Always read and follow label directions and precautions when applying herbicides.**

When interseeding, the existing species are not killed, only suppressed to allow establishment of more productive grasses and legumes. Interseeding is most effective in over utilized Kentucky bluegrass sod. Forage production from pastures can be improved by the inclusion of more productive grasses (bromegrass, orchard grass, etc.) and legumes. Reduce competition between existing smooth bromegrass and other tall grasses that compete with the newly seeded grasses by using suppression rates of herbicide and/or graze heavily the fall before seeding. Red clover is the easiest legume to interseed into a suppressed tall grass sod.
No-till seeding should be used on existing pastures that lack diversity, either in grasses or legumes, on existing pastures that contain species unsuited to the kind and/or class of livestock utilizing the pasture, to improve the nutritional value of an existing pasture, and on most existing pastures or grasslands that contain little debris, rocks, or boulders.

Interseeding with tillage into existing stands

If a no-till drill is not available, it is still possible to interseed legumes into an existing grass stands by using tillage and a conventional grain drill. Disturb the existing sod with a light disc harrow or a harrow/field cultivator combination. If there is an old dense stand of Kentucky bluegrass and quackgrass, fall tillage will help to reduce competition before spring planting. Use enough tillage passes to expose at least 50% bare soil. If the surface is rough after the initial tillage use a drag harrow to level prior to seeding with the drill. Avoid seeding into a "dustbed", and seed into moist but not wet soil. The drill should be equipped with drag chains, or immediately after drilling, the soil should be run over with a cultipacker.

No-Till seeding into either sod or cropland

Use a no-till drill to plant at a depth of ¼ to ½ inch.

More desirable forage species are seeded into the old sod or existing crop residue. This should be the first choice on steep, highly erodible soils.

On land currently in grass, all existing vegetation is killed with herbicides, preferably in the fall prior to planting. Quackgrass and many broadleaf weeds are easier to control when herbicides are fall applied rather than spring applied. On cropland, leave the existing crop residue.

With fall herbicide application, an additional burndown chemical may be needed in the spring prior to planting to kill any weeds and regrowth.

Some broadleaf herbicides can have residual effects lasting several years, please be aware of these herbicides and how they will affect your planning. Read and follow label directions of the previously applied herbicide to determine compatibility with the planned seeding.

Conventional seeding

A seedbed will be prepared that is free of all competing vegetation and is not subject to erosion. All existing vegetation will be killed prior to or during seedbed preparation with tillage and/or herbicides. Seeding on fields with significant weed populations will be delayed until weeds are controlled. If chemical methods are used, multiple applications may be required to achieve satisfactory results. **Some broadleaf herbicides can have residual effects lasting several years, please be aware of these herbicides and how they will affect your planning.** A firm, moist seedbed will be provided in all cases. As a general rule, seedbed is considered firm when the foot tracks left by an adult are not deeper than one-half inch. Grasses and legumes shall be seeded immediately following seedbed preparation. Grasses and legumes shall be drilled uniformly over the area at a depth of ¼ to ½ inch using a grass drill, grain drill with press wheels, cultipacker seeder or by broadcasting the seed.

When a cyclone or endgate type seeder is used, light, fluffy seeds will be sown as a separate operation from legume or dense smooth seeds. Seedbeds that are too soft may be firmed by harrowing, packing with two or more passes with an empty drill, or cultipacker. Cultipacker seeders most consistently assure shallow seed placement. If a grain drill with a legume box is used, seed tubes should be positioned to deposit seed behind the coulters or openers which seed small grains.

Frost seeding

Graze to a very low stubble height the season before seeding, use a suppression rate of herbicide or mow very short(< 2" tall). Broadcast the legume seed on top of the ground in late winter (late February or March) or early spring when freezing and thawing help to incorporate the seed into the soil. Do not seed on snow cover, especially on steeper soils. Snow melt may carry the seed away in runoff. Frost seeding also works well on small disturbed areas within a pasture. Use this method where it is impractical or impossible to use conventional seeding equipment such as steep slopes,

rough terrain, and rock outcrops. Red clover and white clover are vigorous and competitive with existing sods and are the ideal species for adding legumes to grass pastures. Use flash grazing after seeding to suppress the grasses and allow legumes to establish.

Seeding Rates

Red Clover and White Clover are the two most easily established legumes for interseeding into established cool season grass pastures. A common interseedng rate is 6-8 pounds of pure live Red Clover seed per acre and 1-2 pounds of pure live White Clover Seed per acre. Native warm season grass seeding rates may be found in the latest version of the 512 Seed Tool.