

Topdressing hay fields with manure can build soil fertility with on-farm resources and help expand acres for spreading.

Introduction

Manure is an excellent nutrient source for fertilizing hay fields, especially with current high fertilizer prices. Topdressing hay fields with manure can build soil fertility with on-farm resources and help expand acres for spreading. However, for efficient use of manure some considerations have to be made.

Grass Hay

Grass hay has a high demand for all manure nutrients and will make more efficient use of manure nutrients compared to legume based hay. If manure is not spread between hay cuttings it should be stored and spread in the fall when manure nutrient use efficiency is generally very low. Therefore application of manure on hay fields can increase the economic return from manure nutrients compared to late fall applications of the same manure for next year's crops.

When manure is used as the sole source of nitrogen for a grass hay crop, other nutrient levels in the soil, specifically phosphorous and potassium may increase over time.

The following management is recommended for application of manure on grass hay fields:

1. Follow regular soil testing to monitor soil nutrient level.
2. Manure should be applied as soon as possible after cutting to reduce potential injury to the regrowth.
3. Apply manure when soil is not wet. Driving heavy manure spreaders on wet soils causes soil compaction.
4. Nitrogen application rate should be based on the expected yield of the next growth. The actual rate should be 50 lb N/ton of expected hay yield.
5. On average, 1000 gallons of slurry contains 22-28 lb of N and one ton of solid manure contains 8-10 lb N. However, on average only 50% of N in manure is available for the current crop thus, you should expect only 40 lb of N/A if you are applying 3000 gals of liquid manure; $(3000 \text{ gal/A} \times 26 \text{ lb N}/1000 \text{ gal} \times 0.50 = 40)$.
6. Depending on the rate applied, supplemental fertilizer N may be needed for maximum hay production.
7. Liquid manure is probably best on hay fields because there is less chance of smothering and producers are less likely to gather up remnants of the manure in the next hay harvest.

Alfalfa Hay

Compared to grass hay, alfalfa requires high phosphorus and potassium levels making manure an excellent source of these nutrients as well as boron for alfalfa production. Some research in Wisconsin and Minnesota has shown manure can sometimes improve alfalfa yields when compared with commercial fertilizer sources. However, there are significant challenges in managing manure on alfalfa without damaging the productivity of the stand, particularly with solid manure and manure slurries.

Some caution is needed to prevent damage to establishing and established alfalfa fields from manure applications.

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Established Alfalfa

1. Apply manure as soon as possible after harvest to avoid salt burn injury and wheel track damage to regrowing alfalfa.
2. Use equipment that applies uniformly and without clumps.
3. Apply to older and poorer stands.
4. Consider the potential for forage contamination with the Johne's disease.
5. Johne's bacterium is not absorbed by plants, but resides on manure and soil particles for a limited time. Allow more time between manure applications and forage harvest, minimize forage contact with soil and manure particles and use the forage as silage because fermentation kills the organism. Calves are more susceptible to the disease than mature animals.

Seeding Alfalfa

Applying manure before alfalfa seed is planted is excellent for alfalfa production while avoiding many problems associated with surface application on established stands.

1. Manure applied before planting must be incorporated into the soil.
2. The alfalfa seed should not be in direct contact with a manure layer during germination, and the seedling should not grow through a layer of manure at the soil surface.
3. The preplant application strategy is best suited for producers who have slurry or solid manure systems.
4. Producers should be prepared to manage the increased weed pressure with timely harvests or herbicides.

Resources

Applying Manure to Alfalfa, Pros, Cons, and Recommendations for Three Application Strategies. University of Wisconsin Cooperative Extension Service. <http://www.soils.wisc.edu/extension>

Applying Manure to Alfalfa. University of Wisconsin Cooperative Extension Service. University of Wisconsin Cooperative Extension Service. <http://www.uwex.edu/ces/crops/teamforage>

Beegle, D. *Fertilizing Grass Hay Crops with Manure.* Manure Manager. <http://www.manuremanager.com/content/view/1505/131>

Lory, J., et. al., 2002. *Managing Manure for Alfalfa Hay.* <http://www.mbforagecouncil.mb.ca/Forage%20Manual%20Article/5-0%20Forage%20Fertility/5-15%20Manure%20on%20Alfalfa%20Hay-%20Missouri.pdf>

For more information visit www.umass.edu/cdl

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