Water Quality Enhancement Activity – WQL31 – Land application of treated manure

Enhancement Description

This enhancement is for the use of manure that has been treated to reduce odors and/or pathogens prior to land application. Acceptable practices include controlled temperature anaerobic digestion (mesophilic or thermophilic), composting, and chemical treatment or amendment. Waste treatment lagoons and injection of manure alone do not qualify as acceptable practices.

Land Use Applicability

Cropland, Pastureland

Benefits

Utilizing manure for land application not only benefits crop production and soil quality, it also reduces air and water quality concerns if properly treated. Odors have been shown to be significantly reduced when manure is treated before land application. Benefits include reduced odors in the airshed. This lessens the impacts on neighboring properties along with potentially increasing the time and areas available for land application. Working conditions for employees can also be improved by the reduction in odors. Properly treated manure reduces nitrogen loss resulting in improved water quality. Treatment of manure limits the loss of nitrogen to leaching and denitrification, and can help control soil emissions of the greenhouse gas nitrous oxide. Furthermore, treatment provides for increased phosphorus availability which improves phosphorus use efficiency. An additional benefit for treating manure prior to land application is the reduction in pathogens. Human and animal health concerns are diminished due to lower pathogen counts from properly treated animal manure. Reduced or eliminated pathogens from land applied manure also decrease the likelihood water quality contamination from pathogens.

Conditions Where Enhancement Applies

This enhancement applies to crop land use acres, not including orchards and vineyards, and all pasture land use acres.

Criteria

1. Animal manure must be treated with a practice which will reduce odors and/or pathogens prior to the manure being land applied. Acceptable treatment practices include:
   a. Controlled temperature anaerobic digestion (mesophilic or thermophilic)
   b. Composting
   c. Chemical treatments or amendments (as recommended by a Land Grant University in the crop production region)
2. Animal manure is land applied according to a nutrient management plan.

Adoption Requirements

This enhancement is considered adopted when manure has been treated via controlled temperature anaerobic digestion (mesophilic or thermophilic), composting or chemical methods to reduce odors and/or pathogens, and the manure has been land applied according to a nutrient management plan.

Documentation Requirements

1. Documentation of the manure treatment practice(s) used prior to land application to obtain odor and/or pathogen reduction.
2. Documentation of the land application of manure that includes:
   a. Fields where manure is applied,
   b. Manure application rate per field,
   c. Nutrients applied to each field, and
   d. Crops grown in each field.

References

International Plant Nutrition Institute (IPNI). 2012. 4R Plant Nutrition – A Manual for Improving the Management of Plant Nutrition (North American Version). IPNI, Norcross, GA.

USDA-NRCS. 2000. National Engineering Handbook, Part 637, Chapter 2, Composting, Washington, D.C.

USDA-NRCS. 1992. National Engineering Handbook, Part 651, Agricultural Waste Management Field Handbook. Washington, D.C.

Chen, L. and S.K. Yadanaparthi. 2013. Effect of a Polymer on Mitigating Ammonia Emission from Liquid Dairy Manure. Scientific Journal Agricultural Engineering, 1:1-13.