Air Quality Enhancement Activity – AIR01 – Injecting or incorporating manure

Enhancement Description
This enhancement is for injecting manure 2 inches or more below soil surface or incorporating applied manure within 24 hours to keep nutrients in place and manage odors from manure application.

Land Use Applicability
Cropland

Benefits
Injection of liquid manure into the soil is an effective way to reduce odor during the land application of untreated liquid manure while keeping nutrients in place. Solid manures typically cannot be injected, so shallow tillage to incorporate applied manure can be used to reduce odors and protect water quality. Injection or incorporation allows the soil to act as both a trap for odorous gases and an aerobic treatment system. Manure injection or incorporation also reduces manure nitrogen losses to the atmosphere by reducing ammonia volatilization and improves water quality by reducing manure nitrogen and phosphorus losses via surface runoff.

Criteria for Injecting or Incorporating Manure

1. Producer's existing cropping system must include surface application of manure without incorporation.
2. Liquid manure must be injected at least 2 inches deep into the soil.
3. Dry or solid manure must be incorporated with a vertical tillage implement that minimizes surface disturbance and maintains 30% residue cover.
4. Producer must have a current soil test (no more than 5 years old).
5. Producer must have a manure nutrient analysis. At least one analysis of the applied manure must be conducted per year for each year of the enhancement. In circumstances where there is a management change that could impact the manure nutrient analysis, an additional analysis of the manure following the change must be conducted.
6. Nutrient application rates are within the "Land Grant University" recommendations based on soil tests and established yield goals considering all nutrient sources. Rates shall be consistent with the requirements of Conservation Practice Standard 590, Nutrient Management.
7. In cases were residues levels cannot be maintained above 30% a cover crop must be planted after injection or incorporation of manure.

Documentation Requirements for Injecting or Incorporating Manure

- A map showing where the activity was applied
- Dates of application
- Acres treated
- Manure type and amount applied
- Manure application method used (liquid injection or solid incorporation)
- Soil test results
- Manure analysis results
- Crops grown and yields (both yield goals and measured yield)
- Calibration of application equipment

References

Livestock and Poultry Environmental Stewardship Curriculum Lesson 44: Emission Control Strategies for Land Application
(http://www.lpes.org/Lessons/Lesson44/44_Land_Application_Emissions.html)

American Society of Agricultural and Biological Engineers Technical Standard EP379.4 Management of Manure Odors, January 2007
(http://asae.frymulti.com/azdez.asp?search=1&JID=2&AID=23560&CID=s2000&T=2)

United States Department of Agriculture
Natural Resources Conservation Service

IDAHO ADDENDUM 2011
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Additional guidance on injecting/incorporating manure:

Vertical tillage aerates and fractures soil using tined implements and subsoilers. Vertical tillage for incorporating manure will typically involve the use of chisels or cultivators to mix the upper soil profile (5 – 8 inches), but does not invert soil and maintains residue cover. When incorporating manure on Highly Erodible Land during the spring, the producer should perform the tillage incorporation during the non-erosive periods for wind erosion. The critical erosion period is February 1 to May 1. If the field is tilled during the critical period, the producer should delay spring tillage until not more than 14 days before planting.

This activity may NOT be used with the following enhancements:
AIR03, AIR06, ANM01, ANM02, ANM04, ANM05, ANM06, ANM07, ANM08, ANM12, ANM21, ANM22, ENR08, PLT01, PLT06, SOE02, SQL03, WQL06, WQL09, WQL14

Potential duplicate practice: 590 - Nutrient management