United States Department of Agriculture
Natural Resources Conservation Service

# Water Quality and Air Quality Enhancement Activity – AIR01 – Injecting or Incorporating Manure

## Enhancement Description

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

This enhancement is applicable on cropland.

## Benefits

Injecting (applying manure beneath the soil surface) liquid animal manure or directly incorporating (covering or mixing with soil) solid animal manure as fertilizer into topsoil can significantly decrease odor emissions, and can have additional fertilization benefits. Injection of liquid manure into the soil is the most effective way to reduce odor during the land application of untreated liquid manure and keep nutrients in place. Since solid manure typically cannot be injected, incorporation of applied manure can be used to reduce odors from solid manure application and protect/improve 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 residue cover.
4. Producer must have a current soil test (no more than 3 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.

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7. Injection or incorporation of the manure must minimize surface disturbance so that erosion potential is limited.

**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

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# Water Quality and Air Quality Enhancement Activity – AIR01 – Injecting or Incorporating Manure

**State Criteria**

- Producer's existing cropping system must include surface application without incorporation.
- Planned practice includes:
  - Liquid manure injected at least 2 inches deep into the soil, or
  - Dry or solid manure must be incorporated within 24 hours using a vertical tillage implement that minimizes surface disturbance and maintains residue cover.
- Soils shall be sampled and analyzed in accordance with Practice Specification for Nutrient Management (S-590) or NebGuide "Guidelines for Soil Sampling" (G1740).
- All soil samples must be taken prior to applying fertilizer or manure.
- Manure shall be sampled and analyzed annually in accordance with Practice Standard 633 – Waste Utilization and Nebfact "Manure Testing: What to Request" (NF02-507).
- Nutrient application rates are within University of Nebraska recommendations based on soil tests and established yield goals considering all nutrient sources (refer to Practice Standard 590 and Practice Specification (S-590) for Nutrient Management).
- Injection or incorporation of the manure must minimize surface disturbance so that erosion potential is limited.

**Documentation Requirements**

1. Provide a map indicating where the activities were applied.
2. Provide copies of soil test results.
3. Provide copies of manure analysis.
4. Complete the nutrient and fertilizer application table on the last page.
5. Complete the fertilizer/application equipment type and calibration date on the following table:

| Type of Equipment & Capacity | Date of Calibration |
|---|---|
| *1 spread-all (16 ton)* | *11/11/08* |
| | |
| | |
| | |

**I certify that the following information meets specifications and has been provided to NRCS:**

1. Written documentation of the activity performed per documentation requirements.
2. Copies of dated receipts for equipment or services purchased.

I understand that it is my responsibility to obtain all necessary permits and to comply with all laws, regulations and ordinances pertaining to the application of these activities.

**Certified by: _____ Date:_____**

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| Field Information | | | | Commercial Fertilizer and Manure Information | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tract & Field No. | Acres | Crop & Yield | | Date Fertilizer / Manure Applied (m/d/yr) | Form of Commercial Fert,. or Manure | Rate (lb/a) | Application Method | If Manure, Days to Incorp. | N Avail. (lb/a) | P Avail. (lb/a) | Total N Avail. (lb/a) | Total P Avail. (lb/a) |
| *T1234 & F1* | *79.4* | Crop | *Corn* | *4/30/09* | Beef Solids | *16 ton/a* | *Broadcast* | *1* | *152* | *656* | *187* | *656* |
| | | Yield | *212 bu* | | 32-0-0 Liquid | *10 Gal* | *Broadcast (planting)* | | *35* | *0* | | |
| | | Crop | | | | | | | | | | |
| | | Yield | | | | | | | | | | |
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