

Considerations for Manure Application

Setbacks

(Illinois Livestock Management Facilities Act, Section 900.803)

- Applications within ¼ mile of any residence not part of the facility must be injected or incorporated on the day of application UNLESS operation was in existence prior to May 21, 1996 and is applying via irrigation or this existing facility is applying waste on frozen ground
- Manure may not be applied within 200' of surface water unless the water is upgrade or there is adequate diking
- Manure may not be applied within 150' of potable water supply wells
- Manure may not be applied in a 10-year flood plain UNLESS manure is injected or incorporated
- Manure may not be applied in grass waterways

Winter Application of Manure

Application to frozen or snow-covered soils is not recommended. However, if manure application is necessary, only small amounts shall be applied that adequately address waste storage concerns until non-frozen land is available. These instances must be documented in the CNMP records. If winter application is deemed necessary, applications are to be applied only if ALL the following criteria are met:

Application rate is limited to 10 wet tons/acre for solid manure more than 50% moisture and 5 wet tons for manure less than 50% moisture. Applications are to be made on land with at least 90% surface residue cover (e.g. good quality hay or pasture field, all corn grain residue remaining after harvest, all wheat residue cover remaining after harvest).

Manure shall not be applied on more than 20 contiguous acres. Contiguous areas for application are to be separated by a break of at least 200 feet. Utilize those areas for manure application that are furthest from streams, ditches, waterways, surface water, etc. (areas that present the least runoff potential and are furthest from surface water).

Increase the application setback distance to 200 feet “minimum” from all grassed waterways, surface drainage ditches, streams, surface inlets, water bodies. This setback distance may need to be further increased due to local conditions.

Additional winter application criteria for fields with significant slopes more than 5%. Manure shall be applied in alternating strips 60 to 200 feet wide generally on the contour, or in the case of contour strips on the alternating strips. The fields must have erosion control practices implemented and have a RUSLE2 soil loss of less than T.

Manure Application on Steep Fields

Waste shall not be applied to land with slopes over 15%.

Manure Application on Fields Subject to Flooding

Manure is not to be land-applied on soils that are frequently flooded during the period when flooding is expected unless incorporated immediately.

General Liquid Manure Applications

For liquid wastes, the application rate is to be adjusted to the most limiting factor to avoid ponding, surface runoff, subsurface drainage (tile) discharge, the nutrient needs of the field, or the nitrogen or phosphorus risks of the field. The total application is not to exceed the field capacity of the upper 8 inches of soil. See the guide for determining soil moisture content below. No applications should be made when the field reaches 100% of its available capacity. The actual application rate shall be adjusted during application to avoid ponding or runoff. Bare/crusted soils may require some tillage to improve infiltration.

Tile Drained Fields

Fields or areas of fields that are subsurface (TILE) drained require additional precautions. When liquid wastes are applied to fields with TILE drains, the liquid can follow soil macro-pores (in dry soils) directly to the tile drains creating a surface water pollution hazard from direct tile discharge. (A field is considered TILE drained if $\frac{1}{2}$ or more of the field is subsurface (tiled) drained; however, even a field with one subsurface drainage line may present a risk of manure/wastewater movement to subsurface drains and cause a direct discharge. Do not apply application rates (volume) that would exceed AWC in the upper 8 inches.

Prior to manure application, use a tool (AERWAY tool or similar tool) that can disrupt/close (using horizontal fracturing) the preferential flow paths (worm holes, cracks, root channels) in the soil, or till the surface of the soil 3-5 inches deep to a condition that will absorb the liquid wastes. The purpose is to have the surface soil act as a sponge to soak up the liquid manure and keep it out of preferential flow channels. This is especially important if shallow tile are present (<2 feet deep). Any pre-application tillage should leave as much residue as possible on the soil surface. The adsorption of liquid manure by the soil in the root zone will minimize nitrogen loss and the manure/nutrient runoff potential. For perennial crops (hay or pasture), or continuous no till fields where tillage is not an option, all tile outlets from the application area are to be plugged prior to application. This criteria (4b.) may be waived if the producer can verify there is no prior history of manure discharge via subsurface drains. However, if there is a discharge, the producer is liable for damages and may risk being classified as a CAFO.

If injection is used, inject only deep enough to cover the manure with soil. Till the soil at least 3 inches below the depth of injection prior to application, or all tile outlets from the application area are to be plugged prior to application. This criteria may be waived if the producer can verify there is no prior history of manure discharge via subsurface drains. However, if there is a discharge the producer is liable for damages and may risk being classified as a CAFO.

In addition to tillage prior to surface liquid waste application or injection, install in-line tile flow control structures or (inflatable) tile plugs that can mechanically stop or regulate tile flow either

prior to application, or have on site if needed to stop tile flow. Use caution not to back tile water where it may impair the functioning of an offsite subsurface drainage system. This criteria may be waived if the producer can verify there is no prior history of manure discharge via subsurface drains. However, if there is a discharge the producer is liable for damages and may risk being classified as a CAFO.

Repair broken tile or blow holes prior to application.

Guide to Determining Soil Moisture Content

*Soil Conditions that apply to fields in this plan are in **bold**.*

Available Moisture Remaining in the Soil	Sand-Sandy Loam	Loam-Silt Loam	Clay Loam-Clay
0% moisture Wilting point	Dry and loose; flows through fingers	Powdery, sometimes slightly crusted but easily broken into powder	Hard, baked and cracked; difficult to break into powder
50% or less soil moisture	Loose, feels dry	Forms a weak ball when squeezed but will not stick to tools	Pliable but not slick, balls under pressure, sticks to tools
50-75% or less soil moisture	Balls under pressure, but seldom holds together when bounced in hand	Forms a ball under pressure; somewhat plastic; slicks slightly under pressure. Does not stick to tools	Forms a ball; ribbons out between thumb and forefinger, has a slick feeling
75% to Field Capacity	Forms a weak ball, breaks easily when bounced in the hand; can feel moistness	Forms ball; very pliable; slicks readily if relatively high in clay, clings slightly to tools	Easily ribbons out between fingers; has a slick feeling, very sticky.
100% Field Capacity	Soil mass clings together. Upon squeezing, outline of ball is left on hand.	On squeezing, no free water appears on soil, but wet outline of ball on hand	On squeezing, no free water appears on soil, but wet outline of ball on hand. Sticky enough to cling to fingers

Livestock Management Facilities Act Regulatory Provisions

For facilities with > 1,000 animal units,
follow these guidelines on manure application to conform to
state regulatory provisions for the LMFA.

- o)** Waste applied within 1320' (1/4 mile) of any residence not part of facility shall be injected or incorporated on the day of application
- p)** Waste shall not be applied within 200' of surface water unless the water is up-gradient or there is adequate diking and waste will not be applied within 150' of potable water supply wells
- q)** Waste shall not be applied within a 10-year floodplain unless the injection or incorporation method is used
- r)** Waste shall not be applied in waterways
- s)** Waste that is spread on frozen or snow-covered ground will be limited to land areas with:
 - 1. less than 5% slope, OR
 - 2. adequate erosion control provisions exist
- t)** Certified livestock manager shall inspect all bermtops, exterior berm sides, and non-submerged interior berm sides for evidence of erosion, burrowing animal activity, and other indications of berm degradation on a frequency of not less than once every two weeks
- u)** Waste shall not be applied during a rainfall or to saturated soil and that conservative waste loading rates will be used in the case of a high water table or shallow earth cover to fractured bedrock. Caution should be exercised in applying livestock wastes, particularly on porous soils, so as not to cause nitrate or bacteria contamination of groundwaters.

Land Application Record Keeping

Records must be maintained for 5 years

The producer must maintain records to document plan implementation. Records should include the following, when applicable:

- soil test results and recommendations for nutrient application
- amounts, analyses, and source of nutrients applied
- dates and method of nutrient applications
- crop rotations, planting and harvesting dates, yields, and crop residues removed
- results of water, plant, and organic by-product analyses
- dates of review, person performing review, and recommendations that resulted from the review of the CNMP

Operation and Maintenance for CNMP

- Periodic review of plan to determine if adjustments or modifications to the plan are needed. At a minimum, the plan should be reviewed and revised with each soil test cycle (recommended annually).
- Protection of fertilizer and organic by-product storage facilities from weather and accidental leakage or spillage,
- Calibration of application equipment to ensure uniform distribution of material at planned rates
- Documentation of the actual rates at which nutrients were applied. When the actual rates differ from the planned rates, records will indicate reasons for the differences.



MOWERS

Soil Testing PLUS, Inc.
117 East Main Street
P. O. Box 540
Toulon, IL 61483-0540
309-286-2761
800-354-8197
309-286-6251 Fax

MANURE ANALYSIS REPORT

Report For: Dare Farms
Submitted By: Blair Mason
Helena Chemical - Fairview
1285 W Carter Street
PO Box 20
Fairview, IL 61432-

OrderID: 210931

ClientID: 8757

Animal Type: Other
Storage System: Other *slurry*
Analysis As: Lbs / 1,000 Gallons

SampleID	Nitrogen		Phosphorus	Potassium	Sodium	Calcium	Magnesium	Copper	Manganese	Iron	Zinc	Sulfur	Boron	% Total	
	TKN	NH4N	P2O5	K2O	Na	Ca	Mg	Cu	Mn	Fe	Zn	S	B	Solid	Water
Sample 1	45.20	25.30	41.50	28.90										10.92	89.08

Comments:

VALUE OF MANURE	Estimated First Year Available Nutrients		Value of Equivalent Commercial Fertilizer		Value of Commercial Fertilizer Based on Fertilizer Prices As of 05/17/2006	
	Injected or Incorporated within 3 days	Surface Applied / Not Incorporated	Injected or Incorporated within 3 days	Surface Applied / Not Incorporated		
	Lbs / 1,000 Gallons	Lbs / 1,000 Gallons	Dollars / 1,000 Gallons	Dollars / 1,000 Gallons	Dollars / lb	
Nitrogen	28.47	24.17	\$8.68	\$7.37	Nitrogen (Urea)	\$0.30
Phosphorus	33.20	33.20	\$9.83	\$9.83	P2O5 (Triple Super - TSP)	\$0.30
Potassium	26.01	26.01	\$6.03	\$6.03	K2O (Polash)	\$0.23
TOTAL			\$24.54	\$23.23		

COMMENTS

Application of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and 3 or more years by 15%. Availability of N changes depending on the application technique. Injection or incorporation within 3 days of application results in higher N availability. Depending on the storage system, the NH4-N loss can vary 15-20%. Refer to MWPS-18, "Livestock Waste Facilities Handbook" for more information.



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MANURE ANALYSIS REPORT

Report For: Dare Farms
Submitted By: Blair Mason
Helena Chemical - Fairview
1285 W Carter Street
Fairview, IL 61432-

OrderID: 210425

ClientID: 8757

Animal Type: Other

Storage System: Other

Analysis As: Lbs/ 1,000 Gallons

[illegible]

Comments:

Organic Nitrogen - 16.8

VALUE OF MANURE	Estimated First Year Available Nutrients		Value of Equivalent Commercial Fertilizer		Value of Commercial Fertilizer Based on Fertilizer Prices As of 5/17/2006	
	Injected or Incorporated within 3 days <small>Lbs / 1,000 Gallons</small>	Surface Applied / Not Incorporated <small>Lbs / 1,000 Gallons</small>	Injected or Incorporated within 3 days <small>Dollars / 1,000 Gallons</small>	Surface Applied / Not Incorporated <small>Dollars / 1,000 Gallons</small>		<small>Dollars / Lb</small>
Nitrogen	25.85	21.86	\$7.89	\$6.87	Nitrogen (Urea)	\$0.30
Phosphorus	27.12	27.12	\$8.03	\$8.03	P2O5 (Triple Super - TSP)	\$0.30
Potassium	27.36	27.36	\$8.35	\$6.35	K2O (Potash)	\$0.23
TOTAL			\$22.26	\$21.04		

COMMENTS

Application of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and 3 or more years by 15%. Availability of N changes depending on the application technique. Injection or incorporation within 3 days of application results in higher N availability. Depending on the storage system, the $\text{NH}_4\text{-N}$ loss can vary 15-20%. Refer to MWPS-18, "Livestock Waste Facilities Handbook" for more information.



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Report For:

Submitted By: Blair Mason
Helena Chemical - Fairview
1285 W Carter Street
PO Box 20
Fairview, IL 61432-

MANURE ANALYSIS REPORT

OrderID: 220739

ClientID: 8757

Animal Type: Beef Cow

Storage System: Slurry Store *Composite*

Analysis As: Lbs / 1,000 Gallons

SampleID	Nitrogen		Phosphorus	Potassium	Sodium	Calcium	Magnesium	Copper	Manganese	Iron	Zinc	Sulfur	Boron	% Total	
	TKN	NH4N	P2O5	K2O	Na	Ca	Mg	Cu	Mn	Fe	Zn	S	B	Solid	Water
#4 Slurry	43.00	24.80	30.00	23.70										9.77	90.23

Comments:

VALUE OF MANURE	Estimated First Year Available Nutrients		Value of Equivalent Commercial Fertilizer		Value of Commercial Fertilizer Based on Fertilizer Prices As of 3/15/2007	
	Injected or Incorporated within 3 days <small>Lbs / 1,000 Gallons</small>	Surface Applied / Not Incorporated <small>Lbs / 1,000 Gallons</small>	Injected or Incorporated within 3 days <small>Dollars / 1,000 Gallons</small>	Surface Applied / Not Incorporated <small>Dollars / 1,000 Gallons</small>		<small>Dollars / Lb</small>
Nitrogen	29.02	25.30	\$8.85	\$7.72	Nitrogen (Urea)	\$0.30
Phosphorus	24.00	24.00	\$7.10	\$7.10	P2O5 (Triple Super - TSP)	\$0.30
Potassium	21.33	21.33	\$4.95	\$4.95	K2O (Potash)	\$0.23
TOTAL			\$20.42	\$19.14		

COMMENTS

Application of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and 3 or more years by 15%. Availability of N changes depending on the application technique. Injection or incorporation within 3 days of application results in higher N availability. Depending on the storage system, the NH4-N loss can vary 15-20%. Refer to MWPS-18, "Livestock Waste Facilities Handbook" for more information.