

NUTRIENT MANAGEMENT PLAN CONSIDERATIONS

See the attached Illinois Phosphorus Assessment Procedure (Appendix A of the Illinois NRCS, Nutrient Management, 590 Standard) for an explanation of consequences of excessive Phosphorus reaching ground and surface water resources. An assessment rating for each area of the P Risk Assessment procedure has been completed for each field where manure application is proposed. Each area is evaluated individually, and an “average” rating for the field is not given because it is impossible without supporting data to give the proper weight to each area. Therefore, this assessment should be used as a tool when determining nutrient application field priorities.

Additionally, nitrogen can have significant consequences through leaching into groundwater or runoff into surface waters. A nitrogen risk assessment has also been completed for each soil type proposed for manure application. This assessment should be used to determine the timing and method of application that results in the lowest risk possible. See the following Table 1, Nitrogen Risk Assessment, from the Illinois NRCS Nutrient Management, 590 Standard.

WASTE APPLICATION LIMITATIONS

Limitations/restrictions required by the Illinois Department of Agriculture’s Livestock Management Facilities Act (LMFA) Section 900.803 are as follows:

- O) Livestock waste applied within ¼ mile of any residence not part of the facility shall be injected or incorporated on the day of application.
- P) Livestock waste may not be applied within 200 feet of surface water unless the water is upgrade or there is adequate diking, and waste will not be applied within 150 feet of potable water supply wells. *Such setbacks are noted throughout plan.*
- Q) Livestock waste may not be applied within a 10-year flood plain, unless the injection or incorporation method of application is used.
- R) Livestock waste may not be applied in waterways. *Waterways are diagramed within individual fields, and will be avoided for manure application.*
- S) If waste is spread on frozen or snow-covered land, the application will be limited to land areas on which: 1. land slopes are 5% or less, OR 2. adequate erosion control practices exist.
- T) *This requirement applies to earthen storage facilities, and so does not apply to this facility, as this facility utilizes underground concrete storages (i.e. “deep pits”).*
- U) Livestock waste may 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 waste, particularly on porous soils, so as not to cause nitrate or bacteria contamination of groundwaters.

WASTE APPLICATION LIMITATIONS

Limitations/restrictions required by the Illinois NRCS Waste Utilization Standard, Code 633, may be more restrictive than those required by the LMFA, and are as follows:

1. Waste will not be applied to frozen or snow-covered soil over 5% slope unless provisions are made to control runoff & pollution.
2. All cropland where waste will be applied must meet soil loss tolerances. Waste will not be applied to any cropland with slopes greater than 15%. *All fields meet soil loss tolerance.*
3. Waste may be applied to pastureland, hayland (i.e. grass) without incorporation or injection on slopes up to 20% if the land meets soil loss tolerances, and applications are made when runoff is unlikely.
4. No application will occur within 200 feet of wells, sinkholes or surface waters. *Setbacks for these areas are included throughout this plan. See LMFA provision "P" above.*
5. Liquid manures shall not be applied to soils with less than 10" of at least moderately permeable soil over fractured bedrock, sand, or gravel. *This restriction should not be applicable in this area.*
6. No application shall occur on organic soils with a seasonal water table within 1' of the surface. *This restriction should not be applicable in this area.*
7. On flood plains where flooding occurs more frequent than once in 10 years, only the injection or incorporation application method will be used. *See LMFA provision "Q" above.*
8. Waste will not be spread in an established waterway or any area where there may be a concentrated water flow. *Waterways are diagramed within individual fields, and will be avoided for manure application. See LMFA provision "R" above.*

Additional Criteria:

Timing of application & handling of wastes will be performed in a manner that maximizes the utilization of nutrients by crops and is consistent with the waste management system plan.

Wastes shall not be applied at rates that exceed crop nutrient requirements or salt tolerances as stated above.

Wastes shall be applied at times when the waste material can be incorporated into the soil by appropriate means within 72 hours of application.

Tillage may be needed to mix wastes with the soil to minimize nutrient loss and control odor. Tillage should be a part of a planned system that adequately controls soil erosion. Tillage should be on the contour, when possible. Tilled areas should be left in a roughened condition until immediately prior to planting.

Application of wastes shall not be performed when soil conditions are such that equipment traffic would cause excessive compaction.

All wastes shall be utilized in a manner that minimizes the potential for pollution of wells, groundwater, streams, or impoundments by seepage, leaching, runoff or surface scouring during flooding.

Liquid wastes shall not be applied at rates that will exceed the infiltration rates of the soil. The total amount of liquid waste applied shall not exceed the moisture holding capacity of the soil profile at the time of application.

Agricultural wastes shall not be applied to frequently flooded soils during periods when flooding is normally expected.

Manures with significant levels of nitrogen in the ammonium form should not be applied in the fall on sands or loamy sands when soil temperature is above 50°F (4" depth) unless a

nitrification inhibitor is added. Even when using a nitrogen inhibitor, manure shall not be applied on coarse textured soils when soil temperature is above 60°F (4" depth).

All waste products will be handled & applied in a manner which will minimize the spread of pathogens to humans, livestock, fish, & wildlife.

Application & transport of wastes must be done in a manner that will not accelerate erosion or compaction of soils.

Animal wastes shall not be applied at rates that exceed the ability of harvested crops to utilize the available nitrogen and/or phosphorus. Solid manure shall not be surface applied at rates providing more than 75 lb/ac of available phosphorus, unless incorporated within 72 hours.

Wastes may be applied based on nitrogen removed by harvested crops, until Bray P1 or Mehlich 3 levels exceed 300 lbs P/ac. When the current soil test exceeds 300 lbs P/ac, wastes should be applied to fields with lower soil P tests, and/or waste should be applied based on the phosphorus removed in the harvested crops.

Under no circumstances shall waste be applied at rates that exceed the nitrogen requirement of the next crop.

OPERATION & MAINTENANCE

It is the producer's responsibility to operate & maintain facilities & equipment so as to preserve their function for environmentally-safe operation. These operations should include, but are not limited to:

1. Inspections of all manure handling equipment prior to & after use, documenting condition & maintenance performed.
2. Inspections of all manure storage facilities for cracks or other potential problems in the structure itself.
3. Inspect the backfill around the facility for excessive settlement, or burrowing animals.
4. Inspect the facility for proper surface water drainage.
5. Mow & maintain aesthetics around the facility to the highest degree possible.

SAFETY RECOMMENDATIONS

1. Deep pit facilities can hold toxic amounts of gases, and these facilities should NEVER be entered alone, without an oxygen mask, or without safety equipment.
2. Be very careful of air conditions inside the facility before, during, & after agitation. Beware of "dead spots" within the building, even if overall air quality is good.
3. Do not leave pump outs opened & unattended. These areas should be marked with hazard signs, & protected from any accidental entering of the pumpout area.

NUTRIENT APPLICATION EQUIPMENT CALIBRATION PROCEDURE

For tankers: Figure the application spread area (width of the toolbar) times the distance traveled for a single load to determine area covered and divide by the gallons in a load. More accurate calibration can be done by weighing the tanker before & after application.

For drag line: All drag line equipment is equipped with a flow meter for application rate monitoring.

MANURE SAMPLING PROCEDURE

Multiple methods exist for sampling deep pit manure storage facilities.

1. Sample prior to agitation & application by inserting a sampling probe (i.e. PVC pipe) into the pit & collecting multiple samples from multiple sites within the building. These samples should be mixed to create a composite sample to be sent to the lab. Caution must be used to avoid getting samples from the bottom ~18" of sludge in the pit, as this always remains & is not land applied.
2. Agitating prior to application for sampling purposes is not recommended for deep pit facilities due to the danger associated with pit gases in the buildings for animals & workers.
3. Sampling during application is the most widely accepted method for manure sampling, and is the method preferred to get an accurate sampling of the waste that is actually applied. Samples should be taken during application at set points (i.e. 250,000 gal, 500,000 gal, 1 mil, 1.5 mil, 2 mil gal) or every day at a certain time. These samples can either be analyzed separately and then averaged for a field, or combined to make one or two composite samples that can be sent in for analysis.
4. Samples should be analyzed for at least Total Nitrogen, Ammonium Nitrogen, Phosphorus & Potassium.

ODOR & PATHOGEN MANAGEMENT

Odor naturally exists with any confined animal operation. These odors can be minimized by utilizing Best Management Practices (BMPs) within & around the facilities. These may include, but are not limited to:

1. Properly washing facilities on a regular schedule to avoid excessive dust buildup in the barns. Washdown of the gestation on a rotating schedule, and washing & disinfection of the farrowing units every 3 weeks is already a part of this facility's protocol.
2. When washing, special attention should be paid to fan shutters & blades.
3. Dust can be minimized in the barns by adding fat to the diets to decrease dust buildup.
4. Pit additives can be used to aid in odor & fly control. This facility currently uses MicroSource.
5. Fly & rodent control can help minimize the transfer of pathogens. Rodent bait boxes should be located throughout the facility exterior, and be monitored regularly. Fly control will follow dust control procedures. Minimizing fly populations in the building will help limit perceived fly and odor problems outside of the buildings, as well as potential pathogen transfer.
6. When handling manure, manure contact with the open air should be limited. On this farm, waste is not exposed to air through drag line application, coupled with injection.
7. Odor can be limited when handling manure by:
 - Conducting activities when wind is not blowing towards a downwind neighbor
 - Avoid activities in periods of excessive humidity, when possible
 - Preparing for timely rendering pickup or composting of dead animals.
 - Keep dead animals covered or blocked from view, and use limestone to raise pH, slow decay, and decrease odors associated with rendering pick up sites.

SOIL TESTING PROCEDURES

Soil testing should be done in accordance with University of Illinois recommendations, which are 2.5 acre soil grids on a 4 year cycle, analyzing at least pH, P & K.