MINNESOTA POLLUTION CONTROL AGENCY
520 Lafayette Road North
St. Paul, MN 55155-4194

Land application records for feedlots with 300 or more animal units

Feedlot Program

Doc Type: Management Plan/Report

Instructions for completing this form are available at: http://www.pca.state.mn.us/feedlots.
Note: Additional records are required for short-term stockpiling and NPDES/SDS permitted sites. An alternative recordkeeping form that can be used when manure ownership is transferred is available at: http://www.pca.state.mn.us/feedlots.
Note: The electronic records form found in the MPCA manure management planner can be used in place of this form. It is available at: http://www.pca.state.mn.us/feedlots.

Cropping year: September 1, _____ to August 31, _____ Cropland manager's name: _____

Name of facility where manure generated: _____ **Registration number:** _____

Licensed commercial animal waste technician name (if used): _____ **License no.:** _____

Manure analysis results (In the spaces provided, enter the most recent analysis alone or as part of a running average – *entries must represent manure applied.*)

Manure source 1: _____ Date last analyzed: _____
N: _____ P_2O_5: _____ K_2O: _____ Units: ☐ lb/ton ☐ lb/1000 gal.

Manure source 2: _____ Date last analyzed: _____
N: _____ P_2O_5: _____ K_2O: _____ Units: ☐ lb/ton ☐ lb/1000 gal.

Manure source 3: _____ Date last analyzed: _____
N: _____ P_2O_5: _____ K_2O: _____ Units: ☐ lb/ton ☐ lb/1000 gal.

Manure source 4: _____ Date last analyzed: _____
N: _____ P_2O_5: _____ K_2O: _____ Units: ☐ lb/ton ☐ lb/1000 gal.

Field information		Soil testing information (Test required every 4 yrs)				Crop information					Manure application information				Nitrogen application rate (lb N/ac)				P application rate (lb P_2O_5/ac)		
						Crops grown									(N1)	(N2)	(N3)				
Field ID	Acres actually used	Year of most recent test	Soil test phosphorus field average	Bray or Olsen	Organic matter Med/High or Low	Crop grown to utilize the nutrients applied	Crop most recently harvested	Expected yield (crop receiving manure)	N Needs (lb/ac) (removal for legumes)	P_2O_5 Needs (lb/ac) (based on soil test data)	Manure source (1-8)	Dates of application	Application rate per acre	Method of application and incorporation Knife injection Sweep injection Surface <12 hr Incorp Surface <4 day Incorp Surface 4+ day Incorp	Fertilizer N applied + irrigation water N	Carry-over N Last year's manure	Manure N this year's	Total available N (N1 + N2 + N3)	Fertilizer P applied	Manure P this year's	Total available P this year
Example	*40*	*2015*	*55*	*Olsen*	*Low*	*Corn*	*Soybeans*	200	180	0	*1*	*Nov 2016*	*3000*	*Knife Injection*	5	0	177	182	5	50	55

Land application records for feedlots with 300 or more animal units - *Continued*

Manure analysis results: (If more than 4 manure sources)

Manure source 5: _____ Date last analyzed: _____
N: _____ P_2O_5: _____ K_2O: _____ Units: ☐ lb/ton ☐ lb/1000 gal.

Manure source 6: _____ Date last analyzed: _____
N: _____ P_2O_5: _____ K_2O: _____ Units: ☐ lb/ton ☐ lb/1000 gal.

Manure source 7: _____ Date last analyzed: _____
N: _____ P_2O_5: _____ K_2O: _____ Units: ☐ lb/ton ☐ lb/1000 gal.

Manure source 8: _____ Date last analyzed: _____
N: _____ P_2O_5: _____ K_2O: _____ Units: ☐ lb/ton ☐ lb/1000 gal.

Field information		Soil testing information (Test required every 4 yrs)				Crop information					Manure application information				Nitrogen application rate (lb N/ac)				P application rate (lb P_2O_5/ac)		
						Crops grown									(N1)	(N2)	(N3)				
Field ID	Acres actually used	Year of most recent test	Soil test phosphorus field average	Bray or Olsen	Organic matter Med/High or Low	Crop grown to utilize the nutrients applied	Crop most recently harvested	Expected yield (crop receiving manure)	N Needs (lb/ac) (removal for legumes)	P_2O_5 Needs (lb/ac) (based on soil test data)	Manure source (1-8)	Dates of application	Application rate per acre	Method of application and incorporation Knife injection Sweep injection Surface <12 hr Incorp Surface <4 day Incorp Surface 4+ day Incorp	Fertilizer N applied + irrigation water N	Carry-over N Last year's manure	Manure N this year's	Total available N (N1 + N2 + N3)	Fertilizer P applied	Manure P this year's	Total available P this year
Example	*40*	*2015*	*55*	*Olsen*	*Low*	*Corn*	*Soybeans*	200	180	0	*1*	*Nov 2016*	*3000*	*Knife Injection*	5	0	177	182	5	50	55

MINNESOTA POLLUTION CONTROL AGENCY
520 Lafayette Road North
St. Paul, MN 55155-4194

Instructions: Land application records for 300 or more animal units

Feedlot Program

Manure application record keeping form instructions – 300 or more animal units

General: The records listed on this form are required to be kept by the person managing the cropland where manure is spread from feedlots with 300 or more animal units. These instructions further clarify when information is optional and when it is required for meeting state and federal record keeping rules and regulations. The form itself can be found on the Minnesota Pollution Control Agency (MPCA) website at: http://www.pca.state.mn.us/feedlots.

The MPCA recommends that you use this form and provide it when the MPCA or a County Feedlot Officer asks to see your records. An electronic manure management planning spreadsheet that incorporates the record keeping form is available on the MPCA website at http://www.pca.state.mn.us/feedlots. At this website, you can also find record keeping forms for when manure is sold or given away (transferred manure ownership) and a form for keeping required records when manure is from a feedlot with 100 to 299 animal units. Records must be kept at the feedlot site or business address for a period of six years in most cases.

Cropping year: The cropping year begins September 1 the fall prior to harvesting the crop and goes through August 31 the following calendar year. The August 31 date is considered the cropping year. For example: the 2020 cropping year started September 1, 2019, and ended August 31, 2020. The terms “previous year” or “last year” when used on the form refer to the cropping year prior to the one being recorded.

Name of facility where manure generated: Fill in the name of the facility generating the manure that is land applied.

Registration number: This is the number that the MPCA provided to the feedlot to verify that it has been registered with the state. If this number has not been recorded, it can be determined by contacting the County Feedlot Officer or the MPCA (recommended optional information).

Cropland manger’s name: This is the name of the person responsible for managing the land where manure is applied.

Licensed Commercial Animal Waste Technician: Anyone who land applies manure commercially (for hire) must be licensed by the Minnesota Department of Agriculture as a Commercial Animal Waste Technician. Fill in the name and license number of any commercial applicator used. To verify the license status of an applicator, check the following Minnesota Department of Agriculture website: http://www2.mda.state.mn.us/webapp/lis/default.jsp.

Manure analysis results: In the spaces provided include the results of the most recent manure analysis. Under “Manure Source” provide a name that allows identification of the analyzed manure. Annual testing is required by federal regulations for any Concentrated Animal Feeding Operation (CAFO). For non-CAFO operations, analyses can be reduced to once every four years if results from three consecutive years of testing show consistent nutrient content in the manure. Manure must be re-tested any time changes in management are likely to result in changes in the manure’s nutrient content. Manure analysis is not required if the stored or stockpiled manure was produced from less than 100 animal units. For example, an average book value can be used for estimating manure nutrient content and determining manure rates when manure from a stockpile generated by 50 animal units exists at a feedlot that holds a total of 350 animal units. Note in the manure analysis box under “date analyzed” if the nutrient content represents average book values rather than actual manure analyses.

Field information: List a specific field ID (tract number or unique name) and the actual number of acres used for manure application for each field that received manure. Make sure that the field ID matches the field ID used in any manure management plan or maps used to identify the field.

Soil testing information: The feedlot rule requires soil phosphorus testing at least once every four years (300+ au). If multiple samples were taken for different soils within the field, record the field average on this form. For *“Date of Sample”* record the date of the most recent soil analysis with its corresponding results for *“Soil P”* and indicate whether the result was reported as Bray P-1 or Olsen method of analysis by the lab.

Crop information: Crop information is required in the manure management plan. Facilities are also encouraged to record crop information on this form to simplify updates to manure management plans and to help link planned management with actual management. Complete the information for the “Crop Grown” this year and the previous cropping year. This information is necessary to determine recommendations for nutrients.

"*Expected yield"* can be determined by averaging the best four yields obtained over the last five years.

"*N needs*" refers to the crop nitrogen needs for non-legumes (based on University of Minnesota recommendations) and crop N removal for legumes. For more information on N needs for corn production refer to the MPCA publications Manure nitrogen rates for corn production (wq-f8-18) or Manure management for corn on irrigated sandy soils (wq-f8-52) available on the MPCA website at: www.pca.state.mn.us/feedlots.

For the purposes of these records, "N needs" refers to fertilizer or manure N needs based on crop type, expected yield, soil organic matter, and legume credits from last year's crop and any alfalfa or red clover grown two years ago. The "N needs" column does not factor in the carryover N from any manure applied during the previous year. The carry-over N is included in the "Nitrogen application rates" section. The "N needs" number should be relatively close to the number in the "total available N" column. When legume crops are grown, these crops will often not "need" nitrogen, yet they still will remove a certain amount of available N in the soil. For legumes, crop N removal can be used to complete the "N Needs" column. N removal is shown in your manure plan. For example, if alfalfa yields are 4 tons/acre, then the amount of N that can be removed is: 4 tons/acre * 50.4 lbs N/ton = 202 lbs N/acre.

Crop *"P2O5 Needs*" are typically shown in the manure plan but can be obtained by using the University of Minnesota recommendations for the crop grown (based on soil test P). If no P2O5 is recommended, 0 should be filled in this box. Note that P2O5 "needs" based on soil test results is not the same as P2O5 "removal," which is independent of soil test results. For example, if a soil P2O5 test is 30 ppm, the crop does not need any supplemental phosphorus from manure or fertilizer.

Manure application information: Record specific information on manure applications in this section.

"Manure Source" references the corresponding source of manure under the *"Manure Analysis Results"* heading.

For *"Dates of application"* list the dates or range of dates manure was applied on the field. For example: 10/11 – 10/16, 10/20.

"Application Rate" is a record of the actual quantities of manure applied on each field. Record the total quantity of manure applied per field and per acre. The application rate per acre can be determined by dividing the total amount of manure applied on the field by the number of acres actually used. It is very important that application equipment be calibrated so that accurate application rates are recorded.

The *"Method of application"* provides information necessary to determine nitrogen availability and determine if manure was injected or incorporated when required by rule. Choose one of the options indicated within the heading on the form.

Nitrogen application rates: This part of the record keeping form tracks total nitrogen (N) available for the crop grown on each field. Application rates for N are limited to the "Crop N needs" identified under crop information.

"Fertilizer N applied + Irrigation water N" is the amount of N supplied by fertilizer that is available for this year's crop. For example, if 46 lb N/acre was applied broadcast, the value in this column would be 46 lb N/acre. Also add any N contribution from groundwater irrigation to the fertilizer N applied.

"Carry-over N last year's manure" is N that is released from last year's manure application and available for this year's crop. It is also referred to as 2nd Year N. If the field did not receive manure last season, this value would be 0. If manure was applied last year, the following formula can be used to determine the carry-over N that is available:

Carry-over N (lb/ac)	=	Last year's app. rate*	X	Last year's N content	X	Carry-over N availability factor

**Application rate must be in tons/acre or 1000 gal/acre.*

Carry-over N: Availability factors

Poultry, beef, dairy	.25
Swine	.15

"Manure N – This year's" is the N available to this year's crop from the manure applied during this cropping year. It includes manure applied last fall for this year's crop. It can be caluclated by using the following equation:

Manure N this year's	=	App. rate*	X	N content	X	This year's N availability factor

**Application rate must be in tons/acre or 1000 gal/acre.*

Method of application	Beef	Dairy	Swine	Poultry
Sweep injection	.60	.55	.80	NA
Knife injection	.50	.50	.70	NA
Broadcast – incorporate after 4 days	.25	.20	.35	.45
Broadcast – incorporate 12 hours to 4 days later	.45	.40	.55	.55
Broadcast – incorporate within 12 hours	.60	.55	.75	.70

Example – This year's manure N: Beef manure applied October of 2002 at a rate of 15 ton/ac with nitrogen content of 15 lb/ton would provide about 101 lb/ac of manure for the crop grown in 2003. For this example manure was incorporated two days after application.

101 lb N/ac		15 tons/ac		15 lb N/ton		.45
This year's manure N	=	App. rate*	X	N content	X	This year's N availability factor

"Total available N" is the total amount of N available for this year's crop. It includes the N from *"Carry-over N"*, *"Fertilizer N applied" and "Manure N – This year's".* It is calculated by simply adding the three sources of N together. For the example shown on the form, a total of 177 lb of N/acre was available for the crop to use during the growing season.

Additional information if allowable N rates exceeded: Application rates of N above those allowed by rule must be justified in the producer's manure management plan. If N is applied at rates that supply 20% or more available N than allowed by rule, an explanation of the need for remedial N applications must be included in the records. This explanation must provide the reasons why additional nitrogen was necessary and may include information such as: crop tissue analysis, description of the crop, or weather conditions that may have caused the nitrogen in the manure to be less available than predicted.

Phosphorus application rates: This part of the record keeping form is used to record the total amount of phosphorus (P) that will be available for the crop to use during this cropping season. "*Fertilizer P applied"* is the amount of fertilizer applied to the field for that cropping year. "*Manure P – This Year's"* is calculated by using the following equation:

Manure P (lb P_2O_5/ac)	=	App. rate*	X	P_2O_5 content	X	Availability factor

**Application rate must be in tons/acre or 1000 gal/acre.*

Example: Beef manure applied at a rate of 15 tons/ac with a P_2O_5 content of 10 lb/ton.

120 lb/ac		15 tons/ac		10 lb P_2O_5 /ton		0.80
Manure P (lb P_2O_5/ac)	=	App. rate*	X	P_2O_5 content	X	Availability factor

"Total available P" is determined by adding the *"Fertilizer P" and "Manure P- This year's"* together. Total P_2O_5 applications that exceed the crop's phosphorus removal can result in soil phosphorus build up if this practice occurs repeatedly. Long term soil phosphorus buildup is restricted in certain areas (within 300 feet of waters if soil test P exceeds 21 ppm Bray P1 or 16 ppm Olsen, and on land away from waters if soil test P exceeds 150 ppm Bray P1 or 120 ppm Olsen). See the MPCA publication "Applying Manure in Sensitive Areas" for a detailed explanation of these restrictions and for suggested management practices for preventing soil phosphorus build up. This publication is available from the MPCA website at https://www.pca.state.mn.us/quick-links/feedlots.