



## **Record Keeping Form Instructions – 100 to 299 animal units**

**General Information:** The records listed on this form will allow producers to keep track of manure application sites, rates of manure application, and take the appropriate credits for nitrogen supplied by manure as required for feedlots with 100 to 299 animal units (see Minnesota Rules ch. 7020.2225). Additional records are required if manure is land applied in a drinking water supply management area where the aquifer is designated as vulnerable. In this case, the form titled “Records for 300 or More Animal Units” should be used.

Records must be kept at the feedlot site or business address for a period of six years in most cases. If manure is applied only outside of special protection areas (more than 300 feet from waters) then records only need to be kept for three years.

The MPCA recommends that you use this form and provide it when the MPCA or a County Feedlot Officer asks to see your records. Alternatives to this form can be used if all required information is clearly recorded. For producers that prefer to keep more detailed records on cropping and nutrient applications, the form titled “Records for 300 or More Animal Units” can be used in place of this form.

**Cropping Year:** The time period used to record land application is referred to as the cropping year. This time period is used rather than the calendar year because it provides a simpler method for tracking nutrient loading to a crop. The cropping year begins September 1 the fall prior to harvesting the crop and goes through August 31 the following calendar year. For example, the 2002 cropping year started September 1, 2001 and ended August 31, 2002. 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 that generates the manure that will be 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.

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

**Licensed Commercial Animal Waste Technician:** Anyone that 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 [www.mda.state.mn.us/animalfeed.htm](http://www.mda.state.mn.us/animalfeed.htm).

**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 manure that was analyzed. The minimum analysis frequency of manure is once every four years. Manure must also be re-tested any time changes in management are likely to result in changes in manure nutrient content.

Manure analysis is not required if the stored or stockpiled manure was produced from less than 100 animal units - average book values can be used for estimating the nutrient content of this manure. If analysis of manure is not required provide a name for the manure source and record the book values for the nutrients in the spaces provided.

**Field Information:** List a specific field ID (tract # 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.

**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.

The “*Method of Application*” provides information necessary to determine nitrogen availability and determine if manure was injected or incorporated when required by rule. If manure is surface applied and is not incorporated within 10 days of application, there is no need to identify the number of days to incorporation.

“*Application Rate*” is a record of the actual rate manure was applied on the 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.



**Nitrogen Application Rates:** Application rates for nitrogen (N) are limited to those recommended by the University of MN Extension Service for non-legume crops and to crop removal of N for legume crops (see table at the end of these instructions for legume crops). This part of the record keeping form tracks total N application rates for each field.

“Fertilizer N Applied” is the amount of N supplied by fertilizer that is available for this year’s crop. For example, if 20 lb N/acre was applied as a starter fertilizer, the value in this column would be 20 lb N/acre.

“Carry-Over N” is N that is released from last year’s manure application and available for this year’s crop. It is also referred to as 2<sup>nd</sup> 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:

$$\frac{\text{Carry-Over N (lb/ac)}}{\text{Carry-Over N (lb/ac)}} = \frac{\text{Last year's App. Rate*}}{\text{Last year's App. Rate*}} \times \frac{\text{Last year's N Content}}{\text{Last year's N Content}} \times \frac{\text{Carry-Over N Availability Factor}}{\text{Carry-Over N Availability Factor}}$$

\*Application rates must be in tons/acre or 1000 gal/acre

**Carry-Over N - Availability Factors**

Poultry, Beef, Dairy	.25
Swine	.15

**Example – Carry-Over N:** Beef manure applied during April of 2002 at a rate of 8 ton/ac with a nitrogen content of 15 lb/ton would supply about 30 lb/ac of N for the crops grown in 2003.

$$\frac{30 \text{ lb N/ac}}{\text{Carry-Over N (lb/ac)}} = \frac{8 \text{ tons/ac}}{\text{Last year's App. Rate}} \times \frac{15 \text{ lb N/ton}}{\text{Last year's N Content}} \times \frac{.25}{\text{Carry-Over N Availability Factor}}$$

“Manure N - This Year’s” is the N available to this year’s crop from the manure applied this year. It includes manure applied last fall for this year’s crop. It can be calculated by using the following equation:

$$\frac{\text{Manure N This Year's}}{\text{Manure N This Year's}} = \frac{\text{App. Rate*}}{\text{App. Rate*}} \times \frac{\text{N Content}}{\text{N Content}} \times \frac{\text{This Year's N Availability Factor}}{\text{This Year's N Availability Factor}}$$

\*Application rates must be in tons/acre or 1000 gal/acre

**Example – This Year’s N:** Beef manure applied October of 2002 at a rate of 15 ton/ac with a nitrogen content of 15 lb/ton would provide about 100 lb/ac of manure for the crop grown in 2003. For this example manure was incorporated within 24 hours of application.

$$\frac{101 \text{ lb N/ac}}{\text{This Year's Manure N}} = \frac{15 \text{ tons/ac}}{\text{App. Rate}} \times \frac{15 \text{ lb N/ton}}{\text{N Content}} \times \frac{.45}{\text{This Year's N Availability Factor}}$$

**This Year’s N Availability Factors for Manure**

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

“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 examples used here, a total of 151 lb of N/acre was available for the crop to use during the growing season.

**Crop Removal of Nutrients for Selected Crops**

Crop	Yield Units	Crop Nitrogen Removal (lbs. per unit yield)
Alfalfa	Tons (air dry)	50.4
Alsike Clover	Tons (air dry)	40.8
Birdsfoot Trefoil	Tons (air dry)	45.3
Corn (silage)	Tons (as fed)	9
Grass Hay or Pasture	Tons (air dry)	27.1
Grass / Legume	Tons (air dry)	43.5
Red Clover	Tons (air dry)	45.1
Soybeans	Bushels	3.5