

NATURAL RESOURCES CONSERVATION SERVICE
WASTE UTILIZATION (ACRE)
CODE 633
MONTANA CONSERVATION PRACTICE JOB SHEET

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MT-CPA-223
Rev 08/01

MANURE NITROGEN CREDITING

| | |
|------------------------|---------------|
| PRODUCER | PLANNING DATE |
| ANIMAL (SPECIES) | |
| FORM (LIQUID OR SOLID) | |

NITROGEN

**TOTAL AVAILABLE NITROGEN IN MANURE
(lbs. N/1,000 gal or lbs. N/ton)**

ANALYSIS SOURCE: MT-CPA-227 ____ MT-CPA-228 ____

| | | | |
|---|--|--|-----|
| 1ST YEAR AFTER APPLICATION ¹ | | | (a) |
| 2ND YEAR AFTER APPLICATION ¹ | | | (a) |
| 3RD YEAR AFTER APPLICATION ¹ | | | (a) |

APPLICATION RATE (1,000 gal/ac. or tons/ac.) ²

| | | | |
|----------|--|--|-----|
| 1ST YEAR | | | (b) |
| 2ND YEAR | | | (b) |
| 3RD YEAR | | | (b) |

NITROGEN APPLIED (lbs./ac) = (a) x (b)

| | | | |
|-----------------------------------|--|--|--|
| CROP YEAR (1ST YEAR) ³ | | | |
| CROP YEAR (2ND YEAR) | | | |
| CROP YEAR (3RD YEAR) | | | |

¹ From Estimating Manure Nitrogen, Form MT-CPA-227, line 8, or Manure Test Nitrogen, Form MT-CPA-227, line 7.
² Manure application should be scheduled to meet plant needs using Nutrient Management Specification, Nutrient Checklist, Form MT-ECS-112.
³ Indicate crop year when nutrients will be available. lbs./ac transfers to Nutrient Checklist, Form MT-ECS-112. (Nutrient Management Design and Specification.)

MANURE NITROGEN CREDITING continued

TABLE 1. Nitrogen Availability and Loss as Affected by Method of Application

| <u>BROADCAST – INCORPORATE</u> ¹ | | | <u>INJECTION</u> | | <u>SPRINKLE</u> |
|---|---------|---------|------------------|-------|-----------------|
| <12 hrs. | <4 days | >4 days | Sweep | Knife | |
| ----- | | | ----- | | |
| % Total N | | | | | |
| 70 | 60 | 50 | 90 | 95 | 75 |

¹ Categories refer to the length of time between manure application and incorporation

PHOSPHORUS and POTASSIUM

Pounds per acre P₂O₅ and K₂O available to crops in the 1st year are found by multiplying P₂O₅ or K₂O in manure (from analysis or TABLE 2) times the selected application rate times 80% and 90%, respectively. **No 2nd or 3rd year credits are given.**

If a manure analysis was obtained, list total phosphorus and total potassium, as received. (pounds/ton or pounds/1,000 gal.) Attach manure analysis.

Be sure to enter elemental values only from manure analysis, i.e., P and K—not K₂O or P₂O₅.

TOTAL P = lbs. TOTAL K = lbs.

FORM: Liquid Solid

From manure analysis, calculate lbs./ac. of P₂O₅ and K₂O applied:

| | | | | | | | | |
|---|---|---------------------------------------|---|--|---|-----|---|---|
| <input style="width: 60px;" type="text"/> | X | 2.3 | X | (1,000 GAL./AC. OR TONS/AC.) <input style="width: 60px;" type="text"/> | X | 0.8 | = | (LBS./AC.) <input style="width: 60px;" type="text"/> |
| | | P–P ₂ O ₅ Conv. | | APPLICATION RATE | | | | P ₂ O ₅ |

| | | | | | | | | |
|---|---|--------------------------|---|--|---|-----|---|---|
| <input style="width: 60px;" type="text"/> | X | 1.2 | X | (1,000 GAL./AC. OR TONS/AC.) <input style="width: 60px;" type="text"/> | X | 0.9 | = | (LBS./AC.) <input style="width: 60px;" type="text"/> |
| | | K–K ₂ O Conv. | | APPLICATION RATE | | | | K ₂ O |

If manure analysis is not available, determine of P₂O₅ and K₂O produced from TABLE 2 or from:

| | | | | | | | | | |
|---|---|---|---|---|---|---------------------------------------|---|--|---|
| Has manure been separated? q YES q NO | | Applied Form? q LIQUID q SOLID | | | | | | ADJUSTMENT FOR SEPARATION | |
| <input style="width: 60px;" type="text"/> | / | <input style="width: 60px;" type="text"/> | X | <input style="width: 60px;" type="text"/> | X | 2.3 | = | <input style="width: 60px;" type="text"/> | <input style="width: 60px;" type="text"/> |
| P lbs./day | | Cu. Ft./Day. | | Cu. Ft./Ton* | | P–P ₂ O ₅ Conv. | | P ₂ O ₅ lbs./ton or 1,000 Gallons | |
| <input style="width: 60px;" type="text"/> | / | <input style="width: 60px;" type="text"/> | X | <input style="width: 60px;" type="text"/> | X | 1.2 | = | <input style="width: 60px;" type="text"/> | <input style="width: 60px;" type="text"/> |
| K lbs./day | | Cu. Ft./Day. | | Cu. Ft./Ton* | | K–K ₂ O Conv. | | K ₂ O lbs./ton or 1,000 Gallons | |

* Average volumetric weight for all animals.

Calculate lbs./ac. of P₂O₅ and K₂O applied:

| | | | | | | | | |
|---|---|------------------|---|--|---|-----|---|---|
| <input style="width: 60px;" type="text"/> | X | Application Rate | X | (1,000 GAL./AC. OR TONS/AC.) <input style="width: 60px;" type="text"/> | X | 0.8 | = | (LBS./AC.) <input style="width: 60px;" type="text"/> |
| P ₂ O ₅ Manure | | | | APPLICATION RATE | | | | P ₂ O ₅ |

| | | | | | | | | |
|---|---|------------------|---|--|---|-----|---|---|
| <input style="width: 60px;" type="text"/> | X | Application Rate | X | (1,000 GAL./AC. OR TONS/AC.) <input style="width: 60px;" type="text"/> | X | 0.9 | = | (LBS./AC.) <input style="width: 60px;" type="text"/> |
| K ₂ O Manure | | | | APPLICATION RATE | | | | K ₂ O |

NATURAL RESOURCES CONSERVATION SERVICE

WASTE UTILIZATION (ACRE)
CODE 633

MONTANA CONSERVATION PRACTICE SPECIFICATION / JOB SHEET

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MT-CPA-227
REV 02/2004

ESTIMATING MANURE NITROGEN

1. Is this a beef open feedlot management system? YES NO

| | | | | | | | | | | |
|----------------------|------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|--------------------------------------|
| <input type="text"/> | N_{excr} | = | <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | = | <input type="text"/> | TOTAL LBS. N <input type="text"/> |
| <input type="text"/> | N_{excr} | = | <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | = | <input type="text"/> | |
| <input type="text"/> | N_{excr} | = | <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | = | <input type="text"/> | |
| ANIMAL TYPE | | | NO. OF ANIMALS | | DAYS | | LBS. N/DAY | | LBS. N | |

Are liquids and solids separated? YES NO Manure Form SOLID LIQUID

Pounds N based on Separated Manure Forms

N_{excr} = X = LBS. N LBS. N

2. Estimate portion of nitrogen retained after storage and treatment using TABLE 3.

N_{retain}

Manure Management System: _____

3. Estimate inorganic nitrogen converted from manure nitrogen (mineralization) and becoming available after application using TABLE 4.

N_{conv} 1st year = N_{conv} 2nd year = N_{conv} 3rd year =

4. Estimate portion of nitrogen remaining after denitrification using TABLE 5.

N_{deni} 1st year = N_{deni} 2nd year = N_{deni} 3rd year =

5. Estimate portion of nitrogen remaining due to application of manure using TABLE 1 N_{appl} 1st year =
(No application reduction is taken second or third years when manure is applied first year only).

Application Method: _____ Time (IF APPLICABLE): _____ HOURS / DAYS

6. Calculate nitrogen (NO_3) available for plant uptake for each year.

| | | | | | | | | | | | |
|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|-----------------|
| N_{excr} | X | N_{retain} | X | N_{conv} 1st yr. | X | N_{deni} 1st yr. | X | N_{appl} 1st yr. | = | N_{avail} | |
| <input type="text"/> | X | <input type="text"/> | = | <input type="text"/> | LBS. N 1ST YEAR |
| <input type="text"/> | X | <input type="text"/> | = | <input type="text"/> | LBS. N 2ND YEAR |
| <input type="text"/> | X | <input type="text"/> | = | <input type="text"/> | LBS. N 3RD YEAR |

7. Compute total pounds of manure produced, as excreted. (Use TABLE 2)

Solid Form (USE FOR COMBINED SLURRY/SEMI-SOLID FORMS AND SEPARATED SOLID FORM)

| | | | | | | | | | |
|----------------------|---|----------------------|---|----------------------|---|--------------|---|----------------------|----------------|
| <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | / | <u>32</u> | = | <input type="text"/> | Tons of Manure |
| <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | / | <u>32</u> | = | <input type="text"/> | Tons of Manure |
| <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | / | <u>32</u> | = | <input type="text"/> | Tons of Manure |
| NO. OF ANIMALS | | DAYS | | CU. FT./DAY | | CU. FT./TON* | | | |

Liquid Form (USE FOR SEPARATED LIQUID FORM ONLY)

| | | | | | | | | | |
|----------------------|---|----------------------|---|----------------------|---|---------------|---|----------------------|-------------------------|
| <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | / | <u>7.48</u> | = | <input type="text"/> | 1,000 Gallons of Manure |
| <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | / | <u>7.48</u> | = | <input type="text"/> | 1,000 Gallons of Manure |
| <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | / | <u>7.48</u> | = | <input type="text"/> | 1,000 Gallons of Manure |
| NO. OF ANIMALS | | DAYS | | CU. FT./DAY | | GAL./CU. FT.* | | | |

* Average volumetric weight for all animals.

8. Calculate total pounds of available nitrogen per ton of manure produced.

/ = Lbs. Available N/ton or N/1,000 Gal.
#AVAIL. N 1ST YR TONS OR GALS.

/ = Lbs. Available N/ton or N/1,000 Gal.
#AVAIL. N 2ND YR TONS OR GALS.

/ = Lbs. Available N/ton or N/1,000 Gal.
#AVAIL. N 3RD YR TONS OR GALS.

ESTIMATING BEEF FEEDLOT MANURE PRODUCTION

| ANIMAL TYPE COW, FEEDER, BULL, CALF, HEIFER | NUMBER OF ANIMALS | AVERAGE WEIGHT | NUMBER OF DAYS IN LOT/YEAR | N LBS/DAY/1,000# | P LBS/DAY/1,000# | K LBS/DAY/1,000# |
|---|----------------------|-------------------|-------------------------------|---------------------|---------------------|---------------------|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| ANIMAL TYPE COW, FEEDER, BULL, CALF, HEIFER | % MOISTURE OF MANURE | TOTAL N (LBS./YR) | TOTAL P (LBS./YR) | TOTAL K (LBS./YR) | TOTAL SOLIDS (CU. FT./YR.) | TOTAL SOLIDS (TONS/YR.) |
|---|-------------------------|----------------------|----------------------|----------------------|-------------------------------|----------------------------|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| TOTAL | | | | | | |

$$\begin{array}{ccccccc}
 & & & \text{TONS/AC.} & & & \text{(LBS./AC.)} \\
 \boxed{} & \times & \mathbf{2.3} & \boxed{} & \times & \mathbf{0.8} & = & \boxed{} \\
 \text{LBS P/TON} & & \text{P-P}_2\text{O}_5 \text{ Conv.} & \text{Application Rate} & & & & \text{P}_2\text{O}_5
 \end{array}$$

$$\begin{array}{ccccccc}
 & & & \text{TONS/AC.} & & & \text{(LBS./AC.)} \\
 \boxed{} & \times & \mathbf{1.2} & \boxed{} & \times & \mathbf{0.9} & = & \boxed{} \\
 \text{LBS K/TON} & & \text{K-K}_2\text{O Conv.} & \text{Application Rate} & & & & \text{K}_2\text{O}
 \end{array}$$

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NATURAL RESOURCES CONSERVATION SERVICE

MT-CPA-228
Rev 08/01

MANURE TEST NITROGEN

DATE: _____

1. From manure analysis, list total nitrogen, as received, (pounds/ton or pounds/1,000 gal.).

Attach manure analysis.

q LIQUID q SOLID TOTAL N = LBS.

2. Estimate inorganic nitrogen converted from manure nitrogen (mineralization) and becoming available after application using TABLE 4.

N_{conv} 1st year = N_{conv} 2nd year = N_{conv} 3rd year =

3. Estimate portion of nitrogen remaining after denitrification using TABLE 5.

N_{deni} 1st year = N_{deni} 2nd year = % N_{deni} 3rd year =

4. Estimate portion of nitrogen remaining due to application of manure using TABLE 1. N_{appl} 1st year =
(No application reduction is taken second or third years when manure is applied first year only).

Application Method: _____ Time (IF APPLICABLE): _____ HOURS OR DAYS

5. Calculate nitrogen (NO₃) available for plant uptake for each year.

| N _{test} | X | N _{conv} 1st yr. | X | N _{deni} 1st yr. | X | N _{appl} 1st yr. | = | N _{avail} | |
|----------------------|---|---------------------------|---|---------------------------|---|---------------------------|---|----------------------|-----------------|
| <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | = | <input type="text"/> | LBS. N 1ST YEAR |
| <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | = | <input type="text"/> | LBS. N 1ST YEAR |
| <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | = | <input type="text"/> | LBS. N 1ST YEAR |

6. Compute total pounds of manure produced, as excreted. (Use TABLE 2)
Multiple animal types can be entered.

| NO. OF ANIMALS | | DAYS | | CU. FT./DAY | | CU. FT./TON* | | | |
|----------------------|---|----------------------|---|-------------|---|----------------------|---|----------------------|-----------------|
| <input type="text"/> | X | <input type="text"/> | X | _____ | X | <input type="text"/> | = | <input type="text"/> | LBS. N 1ST YEAR |
| <input type="text"/> | X | <input type="text"/> | X | | X | <input type="text"/> | = | <input type="text"/> | LBS. N 1ST YEAR |
| <input type="text"/> | X | <input type="text"/> | X | | X | <input type="text"/> | = | <input type="text"/> | LBS. N 1ST YEAR |

| NO. OF ANIMALS | | DAYS | | CU. FT./DAY | | CU. FT./TON* | | | |
|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|-----------------|
| <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | = | <input type="text"/> | LBS. N 1ST YEAR |
| <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | = | <input type="text"/> | LBS. N 1ST YEAR |
| <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | X | <input type="text"/> | = | <input type="text"/> | LBS. N 1ST YEAR |

7. Calculate total pounds of available nitrogen per ton (solid) or nitrogen per 1,000 gal. (liquid) of manure produced.

_____ lbs. avail. N 1st yr. (from No. 5) ÷ _____ tons manure (from No. 6) = _____ lbs. avail. N/ton or N/1,000 gal.

_____ lbs. avail. N 2nd yr. (from No. 5) ÷ _____ tons manure (from No. 6) = _____ lbs. avail. N/ton or N/1,000 gal.

_____ lbs. avail. N 3rd yr. (from No. 5) ÷ _____ tons manure (from No. 6) = _____ lbs. avail. N/ton or N/1,000 gal.

* Average volumetric weight for all animals.