Kansas Department of Agriculture

Nutrient Utilization Plan Form

Published by the Kansas Secretary of Agriculture December 15, 1998

This form is required by House Bill 2950 (1998 Session) and the Kansas Chemigation Safety Law, K.S.A. 2-3302 et seq. You must complete this form if:

1. you have an animal unit capacity of 1000 or more hogs; and
2. manure or wastewater (swine waste) from your swine facility is applied to land by any means or process.

This completed form together with all attachments must be approved by the Kansas Secretary of Agriculture BEFORE a permit for your swine facility will be considered for renewal or issuance.

For KDA Office use only:

Date form Received by Secretary of Agriculture: _____ (month) _____ (day), _____ (year).

Date plan approved by secretary (effective date of plan): _____ (month) _____ (day), _____ (year).

Plan expires on: _____ (month) _____ (day), _____ (year).

KDHE application number _____.

KDHE permit number _____.

The goal of nutrient utilization is to protect all ground and surface water and the soils and public health of this state from impairment from swine facilities. To that end, all application of swine waste must be in accordance with agronomic application rates determined by the Kansas secretary of agriculture. This form will be used to address site-specific conditions for land application of manure, wastewater and other nutrient sources and must comply with Section 6 of House Bill 2950.

Please complete the following form. PLEASE PRINT OR TYPE.

1. Name, address, and telephone number of the facility that plans to supply swine waste to be applied to land.

_____Name

_____Address _____Zip

_____County _____Phone

_____animal unit capacity for facility

Please identify all land areas to which swine waste may be applied. (Attach additional pages as needed to identify all land areas.)

_____Section_____Township_____Range

_____Section_____Township_____Range

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_____Section_____Township_____Range

_____Section_____Township_____Range

3. Is the swine facility the owner of the land to which swine waste will be applied?
_____yes _____no

4. If you answered no above, who is the owner of the land?
_____Name
_____Address
_____County _____Phone

5. Please provide a detailed description of the method of the application of swine waste to land:
_____
_____
_____
_____

6. Does your method of application include mixing swine waste with irrigation water?
_____yes _____no

7. If you answered yes to number six, do you have a valid chemigation permit?
_____yes _____no

8. Do you agree not to apply swine waste to frozen or saturated soil except where soil conservation practices to control runoff are followed?
_____yes _____no

9. Do you agree not to apply swine waste to highly erodible land except in accordance with a conservation plan that complies with the federal food security act of 1985?
_____yes _____no

10. Do you agree to incorporate swine waste into soil within 24 hours after applying to bare ground if the application is within 1,000 feet of any habitable structure, wildlife refuge or city, county, state or federal park?
_____yes _____no

11. If you answered no to number 10 above, please identify whether you have a KDHE approved odor reduction plan, a KDHE approved innovative treatment plan, or have been provided with a written waiver by the owner of the habitable structure?
_____
_____

12. Do you agree not to apply swine waste during a rain storm unless soil conservation practices to control erosion and runoff are employed?
_____yes _____no

13. Name, address and telephone number of individual who ensures that the correct agronomic application rate is used.
_____
_____
_____

AMENDMENTS

Any changes to this form between the effective date of the plan and the expiration date of the plan must be attached as an Amendment. Each Amendment must clearly specify which section of the form it amends.

REQUIRED ATTACHMENTS:

A. A site map for the intended location of waste application

B. Copies of all written agreements with parties involved in the application of waste.

C. Description of crop rotations on all land to which swine waste is applied

D. Baseline and annual records of soil tests for each successive year. Each baseline and annual sampling event shall include a completed chain of custody form and laboratory report. Each chain of custody form must include, the date of sampling, a description of each sample collected, including the location, requested analytical method(s), the signature of the person who conducted the sampling, and all other relevant or appropriate information. Each laboratory report shall include the date of analysis, a sample identification that can be matched with the chain of custody, the analytical method(s) used, the result and corresponding units, the signature of the person conduction the analysis, and all other relevant or appropriate information.

E. Baseline and annual records of manure nutrient analysis for the two years following approval of the plan. Each baseline and annual sampling event shall include a laboratory report. Each laboratory report shall include the date of analysis, the analytical method(s) used, the result and corresponding units, the signature of the person conducting the analysis, and all other relevant or appropriate information. If book values are used, cite the publication from which the values were derived.

F. Calculations comparing manure nutrient analysis with soil test results to calculate needed fertility and application rates for pasture production and crop target yields (completed work sheet.)

G. Rates, methods, frequency and timing of application of manure, wastewater and other nutrient sources

H. Amounts of nitrogen and phosphorus applied.

I. Precipitation records and amounts of irrigation and other water applied.

J. Inspection and maintenance records.

K. Training records.

L. Conservation plans for each field applicable to numbers 8, 9 and 12 of this plan.

Nutrient Utilization Plan Worksh . (One per field)

Year: _____

New ☐

Amended ☐

Producer/Farm Name: _____ **County:** _____

Estimated Annual Swine Waste Application (Tons or Gallons): _____

KDHE Permit or Application No: _____	Field ID: _____ Category: _____	Acreage: _____ Maximum P Soil Test Level (ppm P): _____

Col A	Col B	Col C	Col D	Col E	Col F	Col G	Col H	Col I	Col J	Col K
Year	Crop/Veg	Expected Yield Units/acre	Estimated N Removal lbs/acre	Estimated P_2O_5 Removal lbs/acre	Soil Test P (ppm P) Bray-1 Mehlich-3 Olsen	Basis of Application Rate N or P_2O_5	Allowable N or P_2O_5 Application lbs/acre	Swine Waste Application Rate Solids tons/ac Lq 1000 gal/ac	Net Addition (loss) P_2O_5 lbs P_2O_5/ac	Total Swine Waste Applied Solids - Tons Lq - 1000 gal
			N Factor (Table 2, page 9) x Col C	P_2O_5 Factor (Table 2, page 9) x Col C	Circle Above From lab Analysis	Table 3, page 10	Instructions Page 7	Circle Above Col H / Factor (Table 4, page 11)	Col I X P_2O_5 Factor(Table 4, page 11)-Col E	Circle Above Col I x Acres

Instructions For Nutrient Utilization Plan Worksheet

I. TITLE BOX OF WORKSHEET:

1. **KDHE Permit or Application No:**
   Enter the appropriate number if it is available

2. **Field ID and Acres:**
   Use a name or number to identify the field and record the number of acres in the field.

3. **Category and Maximum P soil test level (ppm P):**
   Bray-1; Mehlich-3 or Olsen equivalent.
   This is the category and soil test P level above which no swine waste should be applied.

   Reference: Table 1, page 8

COLUMN A: Year

Enter the year(s) for which you are estimating the nutrient application and removal.

COLUMN B: Crop/Veg

Enter the crop(s) to be grown for the year listed in Col A.

COLUMN C: Expected Yield

Enter the expected yield of the crop listed in Col B.

COLUMN D: Estimated N Removal
(If using P_2O_5 removal, use Col E).

Reference: Table 2, page 9
Select the crop and N removal per unit of crop and multiply the N factor by Col C.

COLUMN E: Estimated P_2O_5 Removal
(If using N removal, use Col D).

Reference: Table 2, page 9
Select the crop and P_2O_5 removal per unit of crop and multiply the P_2O_5 factor by Col C.

COLUMN F: Soil Test P (ppm P)
Enter beginning Soil Test P Level (ppm P) from soil test analysis for the first year **(Circle the test used).**
For subsequent years, refer to Column F on page 2.

COLUMN G: Basis of Application Rate

Reference: Table 3, page 10
Enter the basis for the optimum swine waste application rate.

COLUMN : Allowable N or P_2O_5 application

4. If Col G is based on N recommendation use A (below)
5. If Col G is based on P_2O_5 recommendation use B (next column)

A. N Rec = (YG x Factor x STA) - PCA - PYM - PNST

N Rec = Nitrogen recommended in Lbs/A.
YG = Yield Goal (Col C)
Factor = From Table 5, page 11 (attached) depending on the crop.
If the crop is a legume go to B (next column).
STA = Soil Texture Adjustment:
1.1 for sandy soil
1.0 for medium & fine textured soil.
PCA = Previous Crop Adjustment
100 lbs/A for Alfalfa or Sweet Clover
50 lbs/A for Red Clover
30 lbs/A for Soybeans
20 lbs/A for Fallow
0 lbs/A for all other crops
PYM = Previous Year's swine waste
50 lbs for last year
20 lbs for 2 years ago
0 lbs for no swine waste history
PNST = Profile Nitrogen Soil Test Results
(For the required 24 inch sampling depth)
Where:
Surface: ppm N x .3 x depth (inches) = lbs/A
Subsoil: ppm N x .3 x depth (inches) = lbs/A
Total: = Surface + Subsoil in lbs/A

Example: If the crop is corn and the expected yield is 140 Bu/A, soil texture is silt loam, previous crop is corn, no previous swine waste and the soil test results are 12 ppm for the surface and 6 ppm for the subsoil.
Then: PNST is (12 ppm N x .3 x 6 inches) +
(6 ppm N x .3 x 18 inches) = 54 lbs/A
N Rec = (YG x Factor x STA) - PCA - PYM - PNST
(140 x 1.35 x 1.0) - 0 - 0 - 54
(189 - 54) = **135 lbs/A**

B. If the swine waste application basis is Soil Test P:

1. Col E (x) Col G
2. If the Soil Test P Level is below 50 ppm P, use **1.5 times P_2O_5 removal rate** for a perennial legume crop, or **1 times agronomic N rate** for an annual legume crop or previous to establishment of a perennial legume crop.

COLUMN I: Swine Waste Application (tons/acre or 1000 gal/acre)

1. If Col G is N basis, then Col H divided by N Factor (Table 4, page 11)
2. If Col G is P basis, then Col H divided by P_2O_5 Factor (Table 4, page 11)

COLUMN J: Net Addition (loss) of P_2O_5

1. If Col G is N basis, then Col I x P_2O_5 Factor (Table 4, page 6) - Col E
2. If Col G is P basis, then (Col H - Col E)

COLUMN F: For the following year: *(estimated)*
Bray-1 or Mehlich-3: (Col J divided by 11.5 + current year Col F).
Olsen: (Col J divided by 30.0 + current year Col F).

COLUMN K: Total Swine Waste Applied(tons or 1000 gal)
(Col I x Acres in field)

Table 1: Maximum P Soil Test Level (ppm P)

Enter in the top section of the Nutrient Utilization Plan Worksheet

A. Category Number

B. Maximum P level (The Soil Test P level above which no Swine Waste should be applied)

	Average Annual Rainfall		
Land slope in Percent	**Less than 22 inches**	**22 to 30 inches:**	**Greater than 30 inches**
0 to 5 %	**Category 1** Lowest Vulnerability for Runoff **Maximum P level** Bray-1: 200 Mehlich-3: 200 Olsen: 76	**Category 2** Intermediate Vulnerability for Runoff **Maximum P level** Bray-1: 150 Mehlich-3: 150 Olsen: 57	**Category 3** Greatest Vulnerability for Runoff **Maximum P level** Bray-1: 100 Mehlich-3: 100 Olsen: 38
Greater than 5 %	**Category 2** Intermediate Vulnerability for Runoff **Maximum P level** Bray-1: 150 Mehlich-3: 150 Olsen: 57	**Category 3** Greatest Vulnerability for Runoff **Maximum P level** Bray-1: 100 Mehlich-3: 100 Olsen: 38	

Table 2. Nitrogen & P_2O_5 Removed in Harvested Crop

Crop	Unit	N	P_2O_5
Feed Grains:			
Corn	lbs/bu	.80	.39
Grain Sorghum	lbs/cwt	1.50	.76
Grain Sorghum	lbs/bu	.84	.41
Forages:			
Bermudagrass (hybrid)	lbs/ton	46.00	12.00
Bromegrass	lbs/ton	36.00	13.01
Corn Silage	lbs/ton	8.30	3.45
Fescue, Tall	lbs/ton	38.00	18.00
Sorghum/Sudangrass	lbs/ton	40.00	15.00
Wheat Silage	lbs/ton		
Legumes:			
Alfalfa	lbs/ton	56.00	15.00
Clover, Red	lbs/ton	40.00	10.08
Soybeans	lbs/bu	4.00	.80
Small Grains:			
Barley, Spring	lbs/bu	1.10	.39
Oats	lbs/bu	.80	.25
Rye	lbs/bu	1.17	.34
Triticale	lbs/bu	1.17	.34
Wheat	lbs/bu	1.40	.50
Specialty Crops:			
Canola	lbs/bu	1.88	.92
Cotton	lbs/bale	31.00	12.09
Flax	lbs/bu	2.00	.85
Potatoes	lbs/cwt	.35	.16
Sugar Beets	lbs/ton	4.20	1.49
Sunflowers	lbs/cwt	3.60	1.69

From: Plant Food Uptake (PFU) for Great Plains Crops, Potash & Phosphate Institute.

Table 3: Basis for Swine Waste Application Rate

Enter in Column G:

Soil Test Phosphorus Level (ppm P)		Runoff Vulnerability Category from Table 1		
Bray-1 or Mehlich-3	Olsen	Category 1	Category 2	Category 3
		For legumes: (alfalfa, soybeans, clover, etc)		
0 - 50	0 - 19	Use 1.0 x Agronomic N Require: Annual legumes or prior to establishment of perennial legume. Use 1.5 x P_2O_5 removal rate: Perennial legume crops.		
		For all other crops		
0 - 50	0 - 19	Use 1.0 x Agron N Require.	Use 1.0 x Agron N Require.	Use 1.0 x Agron N Require.
51 - 75	20 - 29	Use 1.5 times P_2O_5 removal	Use 1.5 times P_2O_5 removal	Use 1.5 times P_2O_5 removal
76 - 100	30 - 38	Use 1.5 times P_2O_5 removal	Use 1.5 times P_2O_5 removal	Use 1.0 times P_2O_5 removal
101 - 150	39 - 57	Use 1.5 times P_2O_5 removal	Use 1.0 times P_2O_5 removal	Use No Swine Waste
151 - 200	58 - 76	Use 1.0 times P_2O_5 removal	Use No Swine Waste	Use No Swine Waste
Over 200	Over 76	Use No Swine Waste	Use No Swine Waste	Use No Swine Waste

Table 4. Available N & P From Swine Manure

Solid Handling System	N	P_2O_5
Without Bedding:	**lbs/ton**	**lbs/ton**
Incorporated	5.8	9.2
Surface Applied	2.8	9.2
With Bedding:		
Incorporated	4.7	7.1
Surface Applied	2.2	7.1
Liquid Handling System	**lbs/1000 gal.**	**lbs/1000 gal.**
Liquid Pit:		
Incorporated	94.6	113.1
Surface Applied	40.7	113.1
Lagoon:		
Incorporated	10.8	8.6
Surface Applied	4.6	8.6

Conversion factor: 27,154 gallons = 1 acre-inch

From: Ohio State Bulletin AGF-208-95
Assumptions: 25% of NH_4-N available when surface applied
75% of NH_4-N available when incorporated
33% of organic N available the first year

Table 5. Factors for Calculating Nitrogen Requirement of Different Crops Based on Expected Yield

Crop	Yield in Units	Factor
Barley, grain	bu/acre	1.05
Bermuda grass	tons/acre	40.00
Brome grass	tons/acre	40.00
Corn, grain	bu/acre	1.35
Corn, silage	tons/acre	9.00
Fescue, hay	tons/acre	40.00
Grain Sorghum, grain	bu/acre	1.25
Grain Sorghum, silage	tons/acre	9.00
Oats, grain	bu/acre	1.05
Sunflowers	cwt/acre	5.00
Wheat, grain	bu/acre	1.75

For any crop not listed, consult the KS Dept. Of Agriculture