APPLICATION RECORDS

Manure Application Setback Distances

Operation: MEIER FARMS
Plan File: Meier Farm.mmp
Plan Folder: C:\Program Files\MMP 0.26\Madison Consulting Plans

County: Stephenson
State: Illinois

Plan Saved: 1/19/2009
Init. File Rev: 5/21/2008
Soils File Rev: 5/29/2008

Setback Requirements: CAFO

Feature	Setback Criteria	Setback Distance (Feet)
Subsurface drainage intakes	Manure applied upgradient, no permanent or insufficient vegetated setback	100
Agricultural drainage wells	Manure applied upgradient, no permanent or insufficient vegetated setback	100
Sinkholes	Manure applied upgradient, no permanent or insufficient vegetated setback	200
Waterways or other conduits to surface waters	Manure applied upgradient, no permanent or insufficient vegetated setback	200
Potable water supply wells	All applications	150
Residence, not part of the facility	Injected manure	0

Source: NPDES Permit No. ILA01 (http://www.epa.state.il.us/public-notices/2003/cafo-general-permit/npdes-general-permit.pdf)

Manure Inventory Annual Summary

Operation: MEIER FARMS
Plan File: Meier Farm.mmp
Plan Folder: C:\Program Files\MMP 0.26\Madison Consulting Plans 5/29/2008

County: Stephenson
State: Illinois
Crop Years: 2008-2011

Plan Saved: 1/19/2009
Init. File Rev: 5/21/2008
Soils File Rev:

Manure Source	Plan Period	On Hand at Start of Period	Total Generated	Total Imported	Total Trans-ferred In	Total Applied	Total Exported	Total Trans-ferred Out	On Hand at End of Period	Units
EARTHEN PIT	Jan '08 - Dec '08	10,000	0	0	1,870,000	1,575,360	0	0	304,640	Gal
BUILDING 1	Jan '08 - Dec '08	5,000	550,000	0	0	0	0	550,000	5,000	Gal
BUILDING 2	Jan '08 - Dec '08	5,000	730,000	0	0	0	0	730,000	5,000	Gal
BUILDING 3	Jan '08 - Dec '08	10,000	700,000	0	0	0	0	590,000	120,000	Gal
All Sources	**Jan '08 - Dec '08**	**30,000**	**1,980,000**	**0**	**1,870,000**	**1,575,360**	**0**	**1,870,000**	**434,640**	**Gal**
EARTHEN PIT	Jan '09 - Dec '09	304,640	0	0	2,032,000	2,162,880	0	0	173,760	Gal
BUILDING 1	Jan '09 - Dec '09	5,000	550,000	0	0	0	0	549,000	6,000	Gal
BUILDING 2	Jan '09 - Dec '09	5,000	730,000	0	0	0	0	729,000	6,000	Gal
BUILDING 3	Jan '09 - Dec '09	120,000	700,000	0	0	0	0	754,000	66,000	Gal
All Sources	**Jan '09 - Dec '09**	**434,640**	**1,980,000**	**0**	**2,032,000**	**2,162,880**	**0**	**2,032,000**	**251,760**	**Gal**
EARTHEN PIT	Jan '10 - Dec '10	173,760	0	0	1,870,000	1,984,780	0	0	58,980	Gal
BUILDING 1	Jan '10 - Dec '10	6,000	550,000	0	0	0	0	500,000	56,000	Gal
BUILDING 2	Jan '10 - Dec '10	6,000	730,000	0	0	0	0	670,000	66,000	Gal
BUILDING 3	Jan '10 - Dec '10	66,000	700,000	0	0	0	0	700,000	66,000	Gal
All Sources	**Jan '10 - Dec '10**	**251,760**	**1,980,000**	**0**	**1,870,000**	**1,984,780**	**0**	**1,870,000**	**246,980**	**Gal**
EARTHEN PIT	Jan '11 - Dec '11	58,980	0	0	2,150,000	1,527,120	0	0	681,860	Gal
BUILDING 1	Jan '11 - Dec '11	56,000	550,000	0	0	0	0	600,000	6,000	Gal
BUILDING 2	Jan '11 - Dec '11	66,000	730,000	0	0	0	0	790,000	6,000	Gal
BUILDING 3	Jan '11 - Dec '11	66,000	700,000	0	0	0	0	760,000	6,000	Gal
All Sources	**Jan '11 - Dec '11**	**246,980**	**1,980,000**	**0**	**2,150,000**	**1,527,120**	**0**	**2,150,000**	**699,860**	**Gal**

Planned Manure Applications

Operation: MEIER FARMS
Plan File: Meier Farm.mmp
Plan Folder: C:\Program Files\MMP 0.26\Madison Consulting Plans

County: Stephenson
State: Illinois

Plan Saved: 1/19/2009
Init. File Rev: 5/21/2008
Soils File Rev: 5/29/2008

Month-Year	Field	Target Crop	Manure Source	Equipment	Days to Incorp.	Rate/Acre	Rate Basis	Loads, Speed or Time	Acres Cov.	Total Amount Applied	Avail. N (Lbs/A)	Avail. P_2O_5 (Lbs/A)	Avail. K_2O (Lbs/A)
Apr 2008	Aebley 1 (843)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	8,700 Gal	1-yr N	18.9 Lds	15.6	136,080	191	235	261
Apr 2008	CAPS 1 (1123)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	8,700 Gal	1-yr N	19.4 Lds	16.1	139,680	191	235	261
Apr 2008	CAPS 3 (1123)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	8,700 Gal	1-yr N	14.5 Lds	12.0	104,400	191	235	261
Apr 2008	HOME 4 (1113)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	8,100 Gal	1-yr N	21.9 Lds	19.5	157,680	177	219	243
Sep 2008	Stanley S (1125)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	8,700 Gal	1-yr N	20.2 Lds	16.7	145,440	191	235	261
Oct 2008	CAPS 1 (1123)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	8,300 Gal	1-yr N	18.5 Lds	16.0	133,200	182	224	249
Oct 2008	CAPS 2 (1123)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	8,700 Gal	1-yr N	17.2 Lds	14.2	123,840	191	235	261
Oct 2008	CAPS 3 (1123)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	8,300 Gal	1-yr N	13.9 Lds	12.1	100,080	182	224	249
Oct 2008	HOME 3 (1113)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	6,900 Gal	1-yr N	59.9 Lds	62.5	431,280	151	186	207
Nov 2008	FRANK'S (1123)	Soybean	EARTHEN PIT	CUSTOM TANKER	N/A	6,900 Gal	1-yr N	14.4 Lds	15.0	103,680	151	186	207
Apr 2009	HOME 1 (1113)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	8,700 Gal	1-yr N	130.5 Lds	108.0	939,600	191	235	261
Apr 2009	HOME 2 (1113)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	2,000 Gal	Custom	20 Lds	72.0	144,000	44	54	60
Sep 2009	Messman E (856)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	8,700 Gal	1-yr N	37.5 Lds	31.0	270,000	191	235	261
Sep 2009	Messman W (855)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	8,700 Gal	1-yr N	38.7 Lds	32.0	278,640	191	235	261
Oct 2009	Aebley 2 (843)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	8,700 Gal	1-yr N	40.8 Lds	33.8	293,760	191	235	261
Nov 2009	Aebley 2 (843)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	8,700 Gal	1-yr N	13.6 Lds	11.3	97,920	191	235	261
Nov 2009	Stanley S (1125)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	8,300 Gal	1-yr N	14.2 Lds	12.3	102,240	182	224	249
Dec 2009	Stanley S (1125)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	8,300 Gal	1-yr N	5.1 Lds	4.4	36,720	182	224	249
Apr 2010	HOME 2 (1113)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	6,500 Gal	Custom	64.6 Lds	71.5	465,000	142	176	195

Planned Manure Applications

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County: Stephenson
State: Illinois

Plan Saved: 1/19/2009
Init. File Rev: 5/21/2008
Soils File Rev: 5/29/2008

Month-Year	Field	Target Crop	Manure Source	Equipment	Days to Incorp.	Rate/Acre	Rate Basis	Loads, Speed or Time	Acres Cov.	Total Amount Applied	Avail. N (Lbs/A)	Avail. P_2O_5 (Lbs/A)	Avail. K_2O (Lbs/A)
Apr 2010	HOME 4 (1113)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	6,000 Gal	Custom	16.2 Lds	19.4	116,500	131	162	180
Sep 2010	Aebley 1 (843)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	8,600 Gal	1-yr N	18.7 Lds	15.7	134,640	188	232	258
Sep 2010	Stanley N (1125)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	8,700 Gal	1-yr N	24.7 Lds	20.4	177,840	191	235	261
Oct 2010	Messman E (856)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	8,300 Gal	1-yr N	35.8 Lds	31.1	257,760	182	224	249
Oct 2010	Messman W (855)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	8,300 Gal	1-yr N	36.9 Lds	32.0	265,680	182	224	249
Nov 2010	Aebley 2 (843)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	8,300 Gal	1-yr N	51.9 Lds	45.0	373,680	182	224	249
Nov 2010	HOME 3 (1113)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	6,800 Gal	1-yr N	26.9 Lds	28.5	193,680	149	184	204
Apr 2011	HOME 3 (1113)	Corn	EARTHEN PIT	CUSTOM TANKER	N/A	6,800 Gal	1-yr N	32.2 Lds	34.1	231,840	149	184	204
Sep 2011	CAPS 1 (1123)		EARTHEN PIT	CUSTOM TANKER	N/A	8,700 Gal	1-yr N	19.4 Lds	16.1	139,680	191	235	261
Sep 2011	CAPS 2 (1123)		EARTHEN PIT	CUSTOM TANKER	N/A	8,600 Gal	1-yr N	17 Lds	14.2	122,400	188	232	258
Sep 2011	CAPS 3 (1123)		EARTHEN PIT	CUSTOM TANKER	N/A	8,700 Gal	1-yr N	14.5 Lds	12.0	104,400	191	235	261
Oct 2011	HOME 1 (1113)		EARTHEN PIT	CUSTOM TANKER	N/A	8,600 Gal	1-yr N	129 Lds	108.0	928,800	188	232	258

Manure Application Planning Calendar – January 2008 through December 2008

Field	Total Acres	Spread Acres	Predominant Soil Type	Primary 2008 Crop (Prev. Primary Crop)	Jan '08	Feb '08	Mar '08	Apr '08	May '08	Jun '08	Jul '08	Aug '08	Sep '08	Oct '08	Nov '08	Dec '08
Aebley 1 (843)	15.6	15.6	752C2 (Oneco SIL)	Corn (Wheat)				18.9								
Aebley 2 (843)	45.0	45.0	40C2 (Dodgeville SIL)	Soybean (Corn)												
CAPS 1 (1123)	18.9	16.0	8074A (Radford SIL)	Corn (Wheat)				19.4						18.5		
CAPS 2 (1123)	14.2	14.2	414C2 (Myrtle SIL)	Corn (Wheat)										17.2		
CAPS 3 (1123)	15.4	12.0	105B (Batavia SIL)	Corn (Wheat)				14.5						13.9		
FRANK'S (1123)	16.1	15.0	105B (Batavia SIL)	Corn (Wheat)											14.4	
HOME 1 (1113)	109.5	108.0	414B (Myrtle SIL)	Corn (Wheat)												
HOME 2 (1113)	73.0	71.3	414C (Myrtle SIL)	Soybean (Corn)												
HOME 4 (1113)	19.4	19.4	414C (Myrtle SIL)	Corn (Soybean)				21.9								
Messman E (856)	34.3	31.0	414B (Myrtle SIL)	Soybean (Corn)												
Messman W (855)	32.0	32.0	752C2 (Oneco SIL)	Soybean (Corn)												
Stanley S (1125)	16.7	16.7	506C2 (Hitt SIL)	Wheat (Soybean)									20.2			
Stanley N (1125)	20.4	20.4	412B (Ogle SIL)	Corn (Wheat)												
HOME 3 (1113)	65.0	62.5	414C (Myrtle SIL)	Soybean (Corn)										59.9		
Total	*495.5*	*479.1*						*74.7*					*20.2*	*109.5*	*14.4*	

Crop in field | No. indicates total loads

Manure Application Planning Calendar – January 2009 through December 2009

Field	Total Acres	Spread Acres	Predominant Soil Type	Primary 2009 Crop (Prev. Primary Crop)	Jan '09	Feb '09	Mar '09	Apr '09	May '09	Jun '09	Jul '09	Aug '09	Sep '09	Oct '09	Nov '09	Dec '09
Aebley 1 (843)	15.6	15.6	752C2 (Oneco SIL)	Soybean (Corn)												
Aebley 2 (843)	45.0	45.0	40C2 (Dodgeville SIL)	Wheat (Soybean)										40.8	13.6	
CAPS 1 (1123)	18.9	16.0	8074A (Radford SIL)	Corn (same)												
CAPS 2 (1123)	14.2	14.2	414C2 (Myrtle SIL)	Corn (same)												
CAPS 3 (1123)	15.4	12.0	105B (Batavia SIL)	Corn (same)												
FRANK'S (1123)	16.1	15.0	105B (Batavia SIL)	Soybean (Corn)												
HOME 1 (1113)	109.5	108.0	414B (Myrtle SIL)	Corn (same)				130.5								
HOME 2 (1113)	73.0	71.3	414C (Myrtle SIL)	Corn (Soybean)				20.0								
HOME 4 (1113)	19.4	19.4	414C (Myrtle SIL)	Soybean (Corn)												
Messman E (856)	34.3	31.0	414B (Myrtle SIL)	Wheat (Soybean)									37.5			
Messman W (855)	32.0	32.0	752C2 (Oneco SIL)	Wheat (Soybean)									38.7			
Stanley S (1125)	16.7	16.7	506C2 (Hitt SIL)	Corn (Wheat)											14.2	
Stanley N (1125)	20.4	20.4	412B (Ogle SIL)	Soybean (Corn)												
HOME 3 (1113)	65.0	62.5	414C (Myrtle SIL)	Corn (Soybean)												
Total	*495.5*	*479.1*						*150.5*					*76.2*	*40.8*	*27.8*	*5.1*

Crop in field | No. indicates total loads

Manure Application Planning Calendar – January 2010 through December 2010

Field	Total Acres	Spread Acres	Predominant Soil Type	Primary 2010 Crop (Prev. Primary Crop)	Jan '10	Feb '10	Mar '10	Apr '10	May '10	Jun '10	Jul '10	Aug '10	Sep '10	Oct '10	Nov '10	Dec '10
Aebley 1 (843)	15.6	15.6	752C2 (Oneco SIL)	Wheat (Soybean)									18.7			
Aebley 2 (843)	45.0	45.0	40C2 (Dodgeville SIL)	Corn (Wheat)											51.9	
CAPS 1 (1123)	18.9	16.0	8074A (Radford SIL)	Soybean (Corn)												
CAPS 2 (1123)	14.2	14.2	414C2 (Myrtle SIL)	Soybean (Corn)												
CAPS 3 (1123)	15.4	12.0	105B (Batavia SIL)	Soybean (Corn)												
FRANK'S (1123)	16.1	15.0	105B (Batavia SIL)	Wheat (Soybean)												
HOME 1 (1113)	109.5	108.0	414B (Myrtle SIL)	Soybean (Corn)												
HOME 2 (1113)	73.0	71.3	414C (Myrtle SIL)	Corn (same)				64.6								
HOME 4 (1113)	19.4	19.4	414C (Myrtle SIL)	Corn (Soybean)				16.2								
Messman E (856)	34.3	31.0	414B (Myrtle SIL)	Corn (Wheat)										35.8		
Messman W (855)	32.0	32.0	752C2 (Oneco SIL)	Corn (Wheat)										36.9		
Stanley S (1125)	16.7	16.7	506C2 (Hitt SIL)	Corn (same)												
Stanley N (1125)	20.4	20.4	412B (Ogle SIL)	Wheat (Soybean)									24.7			
HOME 3 (1113)	65.0	62.5	414C (Myrtle SIL)	Soybean (Corn)											26.9	
Total	*495.5*	*479.1*						*80.8*					*43.4*	*72.7*	*78.8*	

Crop in field | No. indicates total loads

Manure Application Planning Calendar – January 2011 through December 2011

Field	Total Acres	Spread Acres	Predominant Soil Type	Primary 2011 Crop (Prev. Primary Crop)	Jan '11	Feb '11	Mar '11	Apr '11	May '11	Jun '11	Jul '11	Aug '11	Sep '11	Oct '11	Nov '11	Dec '11
Aebley 1 (843)	15.6	15.6	752C2 (Oneco SIL)	Corn (Wheat)												
Aebley 2 (843)	45.0	45.0	40C2 (Dodgeville SIL)	Corn (same)												
CAPS 1 (1123)	18.9	16.0	8074A (Radford SIL)	Wheat (Soybean)									19.4			
CAPS 2 (1123)	14.2	14.2	414C2 (Myrtle SIL)	Wheat (Soybean)									17.0			
CAPS 3 (1123)	15.4	12.0	105B (Batavia SIL)	Wheat (Soybean)									14.5			
FRANK'S (1123)	16.1	15.0	105B (Batavia SIL)	Corn (Wheat)												
HOME 1 (1113)	109.5	108.0	414B (Myrtle SIL)	Wheat (Soybean)										129.0		
HOME 2 (1113)	73.0	71.3	414C (Myrtle SIL)	Soybean (Corn)												
HOME 4 (1113)	19.4	19.4	414C (Myrtle SIL)	Soybean (Corn)												
Messman E (856)	34.3	31.0	414B (Myrtle SIL)	Corn (same)												
Messman W (855)	32.0	32.0	752C2 (Oneco SIL)	Corn (same)												
Stanley S (1125)	16.7	16.7	506C2 (Hitt SIL)	Soybean (Corn)												
Stanley N (1125)	20.4	20.4	412B (Ogle SIL)	Corn (Wheat)												
HOME 3 (1113)	65.0	62.5	414C (Myrtle SIL)	Corn (Soybean)				32.2								
Total	*495.5*	*479.1*						*32.2*					*50.9*	*129.0*		

Crop in field	No. indicates total loads

Year:________

Field Application Record

(Include **All** nutrient applications, commercial fertilizer and manure)

Field ID	Acres	Previous Crop	Next Crop	Acres Manure/Fert Applied	Date	Rate gal/ton/lbs per acre	Manure Type or Fertilizer Analysis[1]	Application Method[2]	Quality[3]	Number of Loads	Wind Direction	Hauler Initials

[1] Indicate storage manure is from, manure type (solid or liquid), or fertilizer analysis

[2] Application methods: use following code if desired: B = Broadcast, no incorporation or incorporated more than 12 hours after application; BI = Broadcast, Incorporated within 12 hours; K = Knife injected; S = Sweep injected; I = Irrigated

[3] T = Top, M = Middle, B = Bottom, A = Agitated, NI = Nitrification inhibitor (N-Serve, Agrotain, etc.)

I certify the above is accurate and I am following all application setbacks indicated in my plan ____________________ Date ________

Planned Internal Transfers of Manure

Operation:	MEIER FARMS	***County:***	Stephenson	***Plan Saved:***	1/19/2009
Plan File:	Meier Farm.mmp	***State:***	Illinois	***Init. File Rev:***	5/21/2008
Plan Folder:	C:\Program Files\MMP 0.26\Madison Consulting Plans			***Soils File Rev:***	5/29/2008

Month-Year	Manure Source	Amount	Manure Destination
Feb 2008	BUILDING 1	90,000 Gal	EARTHEN PIT
Feb 2008	BUILDING 2	120,000 Gal	EARTHEN PIT
Apr 2008	BUILDING 1	90,000 Gal	EARTHEN PIT
Apr 2008	BUILDING 2	120,000 Gal	EARTHEN PIT
Apr 2008	BUILDING 3	220,000 Gal	EARTHEN PIT
Jun 2008	BUILDING 1	95,000 Gal	EARTHEN PIT
Jun 2008	BUILDING 2	120,000 Gal	EARTHEN PIT
Aug 2008	BUILDING 1	90,000 Gal	EARTHEN PIT
Aug 2008	BUILDING 2	120,000 Gal	EARTHEN PIT
Aug 2008	BUILDING 3	250,000 Gal	EARTHEN PIT
Oct 2008	BUILDING 1	95,000 Gal	EARTHEN PIT
Oct 2008	BUILDING 2	130,000 Gal	EARTHEN PIT
Oct 2008	BUILDING 3	120,000 Gal	EARTHEN PIT
Dec 2008	BUILDING 1	90,000 Gal	EARTHEN PIT
Dec 2008	BUILDING 2	120,000 Gal	EARTHEN PIT
Feb 2009	BUILDING 1	90,000 Gal	EARTHEN PIT
Feb 2009	BUILDING 2	120,000 Gal	EARTHEN PIT
Feb 2009	BUILDING 3	200,000 Gal	EARTHEN PIT
Apr 2009	BUILDING 1	99,000 Gal	EARTHEN PIT
Apr 2009	BUILDING 2	9,000 Gal	EARTHEN PIT
Apr 2009	BUILDING 2	120,000 Gal	EARTHEN PIT
Apr 2009	BUILDING 3	4,000 Gal	EARTHEN PIT
Apr 2009	BUILDING 3	150,000 Gal	EARTHEN PIT
Jun 2009	BUILDING 1	90,000 Gal	EARTHEN PIT
Jun 2009	BUILDING 2	120,000 Gal	EARTHEN PIT
Aug 2009	BUILDING 1	90,000 Gal	EARTHEN PIT
Aug 2009	BUILDING 2	120,000 Gal	EARTHEN PIT
Aug 2009	BUILDING 3	200,000 Gal	EARTHEN PIT
Sep 2009	BUILDING 2	60,000 Gal	EARTHEN PIT
Oct 2009	BUILDING 1	90,000 Gal	EARTHEN PIT
Oct 2009	BUILDING 2	60,000 Gal	EARTHEN PIT
Nov 2009	BUILDING 3	200,000 Gal	EARTHEN PIT
Dec 2009	BUILDING 1	90,000 Gal	EARTHEN PIT
Dec 2009	BUILDING 2	120,000 Gal	EARTHEN PIT
Feb 2010	BUILDING 1	90,000 Gal	EARTHEN PIT
Feb 2010	BUILDING 2	125,000 Gal	EARTHEN PIT
Mar 2010	BUILDING 3	200,000 Gal	EARTHEN PIT
Apr 2010	BUILDING 1	95,000 Gal	EARTHEN PIT
Apr 2010	BUILDING 2	120,000 Gal	EARTHEN PIT

Planned Internal Transfers of Manure

Operation:	MEIER FARMS	***County:***	Stephenson	***Plan Saved:***	1/19/2009
Plan File:	Meier Farm.mmp	***State:***	Illinois	***Init. File Rev:***	5/21/2008
Plan Folder:	C:\Program Files\MMP 0.26\Madison Consulting Plans			***Soils File Rev:***	5/29/2008

Month-Year	Manure Source	Amount	Manure Destination
Apr 2010	BUILDING 3	100,000 Gal	EARTHEN PIT
Jun 2010	BUILDING 1	90,000 Gal	EARTHEN PIT
Jun 2010	BUILDING 2	120,000 Gal	EARTHEN PIT
Aug 2010	BUILDING 1	90,000 Gal	EARTHEN PIT
Aug 2010	BUILDING 2	125,000 Gal	EARTHEN PIT
Aug 2010	BUILDING 3	200,000 Gal	EARTHEN PIT
Oct 2010	BUILDING 1	95,000 Gal	EARTHEN PIT
Oct 2010	BUILDING 2	120,000 Gal	EARTHEN PIT
Oct 2010	BUILDING 3	150,000 Gal	EARTHEN PIT
Nov 2010	BUILDING 1	40,000 Gal	EARTHEN PIT
Nov 2010	BUILDING 2	60,000 Gal	EARTHEN PIT
Nov 2010	BUILDING 3	50,000 Gal	EARTHEN PIT
Jan 2011	BUILDING 1	100,000 Gal	EARTHEN PIT
Jan 2011	BUILDING 2	120,000 Gal	EARTHEN PIT
Mar 2011	BUILDING 1	90,000 Gal	EARTHEN PIT
Mar 2011	BUILDING 2	120,000 Gal	EARTHEN PIT
Mar 2011	BUILDING 3	200,000 Gal	EARTHEN PIT
Apr 2011	BUILDING 1	40,000 Gal	EARTHEN PIT
Apr 2011	BUILDING 2	60,000 Gal	EARTHEN PIT
Apr 2011	BUILDING 3	90,000 Gal	EARTHEN PIT
Jun 2011	BUILDING 1	95,000 Gal	EARTHEN PIT
Jun 2011	BUILDING 2	120,000 Gal	EARTHEN PIT
Aug 2011	BUILDING 1	95,000 Gal	EARTHEN PIT
Aug 2011	BUILDING 2	120,000 Gal	EARTHEN PIT
Aug 2011	BUILDING 3	200,000 Gal	EARTHEN PIT
Oct 2011	BUILDING 1	90,000 Gal	EARTHEN PIT
Oct 2011	BUILDING 2	120,000 Gal	EARTHEN PIT
Oct 2011	BUILDING 3	160,000 Gal	EARTHEN PIT
Nov 2011	BUILDING 1	45,000 Gal	EARTHEN PIT
Nov 2011	BUILDING 2	70,000 Gal	EARTHEN PIT
Nov 2011	BUILDING 3	50,000 Gal	EARTHEN PIT
Dec 2011	BUILDING 1	45,000 Gal	EARTHEN PIT
Dec 2011	BUILDING 2	60,000 Gal	EARTHEN PIT
Dec 2011	BUILDING 3	60,000 Gal	EARTHEN PIT

Internal Transfers of Manure

Operation: MEIER FARMS **County:** Stephenson **Plan Saved:** 1/19/2009
Plan File: Meier Farm.mmp **State:** Illinois **Init. File Rev:** 5/21/2008
Plan Folder: C:\Program Files\MMP 0.26\Madison Consulting Plans **Soils File Rev:** 5/29/2008

Manure Source	Date	Amount Gal or Ton	Manure Destination	Purpose of Transfer

Check Calibration Method Used

Form 13-A

(One sheet for each method used)

Date: 2009

Method Used	Calibration Methods	Equipment & Travel Speed/Gear	Information You Need
☒	Liquid manure in storage *(Note: tanker, towed hose, or irrigation)*	8500 Gal/Acre	• Total gallons spread • Total acres receiving manure
☐	Liquid manure in spreader		• Gallons in spreader load • Distance driven and width spread
☐	Liquid manure in spreader		• Pounds in spreader load • Distance driven and width spread
☐	Liquid manure via towed-hose: flow meter or pump mfg's chart		• Liquid flow rate to toolbar • Ground speed • Width spread
☐	Solid/semi-solid manure in storage		• Cubic feet spread • Total acres receiving manure
☐	Solid manure in spreader		• Spreader volume, bushels • Distance driven and width spread
☐	Solid manure in spreader		• Pounds/tons in spreader load • Distance driven and width spread
☐	Solid manure in spreader		• Area of drive-over sheet • Net weight of manure deposited on sheet (averaged)
☐	5-gallon bucket		Net weight of manure in bucket
☐	Liquid manure via sprinkle irrigation		Inches collected in gauges

Appendix 13A Calibrating Manure Spreading

The use of animal manure as a cropland fertilizer is economically and environmentally important. However, farmers cannot simply spread manure. They must know the nutrient quality of the manure and control the quantity and uniformity of the manure spread to ensure that the entire crop receives the nutrients.

The nutrient content of the manure is estimated from laboratory tests, and the quantity to apply is determined through computations of crop need. Farmers can receive this information from their county Extension office or other nutrient management planners. In practice, farmers often do not know exactly how much or how uniformly manure has been applied. Manure spreader calibration provides this important information.

Manure spreaders can discharge manure at varying rates, depending on forward travel speed, PTO speed, gear box settings, discharge opening, width of spread, overlap patterns, and other parameters. Calibration defines the combination of settings and travel speed needed to apply manure at a desired rate. Following is a description of the measurement methods used to determine manure application rates and ensure uniform application.

Calibration techniques

Calibration requires the measurement of the quantity of manure applied to the soil under different conditions. There are two calibration techniques: the *load-area* method, which involves measuring the amount of manure in a loaded spreader and then calculating the number of spreader loads required to cover a known land area; and the *weight-area* method, which requires weighing manure spread over a small surface and computing the quantity of manure applied per acre.

The calibration method to use depends on the type of manure spreader. Soil-injection, liquid manure spreaders must be calibrated using the load-area method because soil-injected manure cannot be collected. Liquid manure surface applied through a tank spreader is also best measured by the load-area method because of the difficulty in collecting the liquid manure, but it can be measured with the weight-area method. Solid and semisolid manure also can be measured with either method.

Load-area calibration
Load-area calibration requires measuring the quantity of manure (tons or gallons) held in a spreader load; spreading a number of identical loads at a constant speed, spreader setting and overlap; measuring the total area of the spread; and computing the quantity of manure applied per acre. After completing the following steps, record the calculations on Worksheet 1, Manure Spreader Capacity and Worksheet 2, Load-Area Calibration.

Step 1. Determine the capacity of the manure spreader. The capacity of the manure spreader must be expressed in units compatible with the units used for the nutrient analysis and recommended application rate. In some cases, the manufacturer provides the appropriate information; in other instances, the manufacturer's information must be converted.

Liquid manure. Liquid manure analysis is expressed in pounds of nutrient per gallon and the application rate is provided in gallons per acre; therefore, use gallons to express the capacity of a liquid manure spreader. Manufacturers specify liquid manure spreaders by gallons of volumetric capacity. This information can be found in the owner's manual.

Solid and semisolid manure. Solid and semisolid manure analysis is expressed in pounds of nutrient per ton and the application rate is provided in tons per acre; therefore, solid and semisolid manure spreader capacity must be expressed in tons of manure.

Solid and semisolid manures of different moisture content have different weights; thus, the weight capacity of the spreader changes according to the kind of manure held. The most direct and accurate method of determining the weight of a load of manure is to actually weigh the spreader load on farm scales. If scales are not available, use the procedure in the next section to convert the volumetric capacity of the spreader to weight capacity for the particular manure held. Record your calculations on Worksheet 1, Manure Spreader Capacity.

Converting volumetric capacity to weight capacity. The volumetric capacity of box-type and open-tank or barrel spreaders for solid and semisolid manure is expressed in cubic feet. The manufacturer provides this information in the owner's manual. Two capacities

are usually provided: heaped load (manure piled higher than the sides of the box) and struck load (the volume contained within the box). The capacity of older spreaders is sometimes designated in bushels; multiply the bushel capacity by 1.24 to determine capacity in cubic feet.

Multiply the volumetric capacity in cubic feet by the bulk density of the manure (in pounds per cubic foot) and convert it to tons. Bulk density depends on the amount of water, solids and air in the manure and can be measured by weighing a known standard volume of manure. A 5-gallon bucket has a volume of 2/3 cubic foot and can be used as a standard volume as follows:

1. Weigh the empty bucket and write the weight on the side of the bucket. This establishes the bucket's tare weight (the container weight subtracted from the gross weight to determine the weight of the manure).
2. Fill the bucket with manure from the loaded spreader. Use all the space in the bucket and pack the manure to the same density as in the spreader.
3. Weigh the full bucket and subtract the tare weight. The result is the manure weight in pounds.
4. Multiply the manure weight by 3 and then divide the product by 2. This gives the manure bulk density in pounds per cubic foot of volume.
5. Multiply the manure bulk density (in pounds per cubic foot) by the spreader capacity (in cubic feet) to get the weight of the spreader load in pounds. Divide by 2,000 to get tons.
6. Repeat this procedure at least three times. Sample the manure at different places and in different spreader loads. Average the values to obtain a representative composite of the manure.

Step 2. Spread manure on a selected field. Spread at least three full loads of manure on a field. Maintain the same speed and spreader setting for each load. Choose spreader path spacing to achieve what appears to be the most uniform coverage. Try to spread in a rectangle or square for easy calculation.

Step 3. Measure the area of the spread. Place flags at the corners of the spread area. Measure the width and length between the flags in feet using a measuring tape, measuring wheel, or consistent pace. Multiply the length by the width and divide that product by 43,560 to determine the area in acres.

Step 4. Compute the application rate. Multiply the number of loads spread by the number of tons or gallons per load to determine the total amount of manure applied to the area. Divide the total amount of manure by the area of the spread in acres to determine the application rate in tons per acre or gallons per acre.

The load-area method should be repeated at different speeds and spreader settings until the desired application rate is obtained. Maintain a record of the application rates at different settings to avoid recalibrating the spreader each season.

Weight-area calibration

Spreader calibration by weight-area requires laying out a ground sheet of known dimensions on the soil; spreading manure over it at a selected speed, spreader setting and overlap; retrieving the ground sheet and the manure deposited on it; weighing the manure retrieved; and computing the quantity of manure applied per acre. The weight-area method does not require measuring the amount of manure in the spreader. As you complete the following steps, record your calculations on Worksheet 3. Weight-Area Calibration.

Step 1. Select a manure collection surface. A ground sheet can be a cloth or plastic (6 mil) sheet of at least 100 square feet (10 feet by 10 feet) in area. Multiply the length of the sheet by the width to determine its area in square feet.

Liquid manure may run off a flat ground sheet; shallow plastic or metal pans are more useful. The pans should have a minimum area of 1 square foot each. Multiply the length of one pan by its width to determine the area of one pan. Multiply the area of one pan by the number of pans used to determine the total collection area in square feet. For handling and cleaning convenience, place the pan inside a plastic garbage bag for each field test so that the bag and manure can be discarded leaving the pan clean. Six or more pans are necessary for a test.

Weigh the ground sheet or pan and record the weights for use as a tare weight in calculations. Dirty sheets and pans can be used for multiple tests only after major manure deposits have been removed. Dirty sheets and pans must be weighed before each test so that any manure residue is included in the new tare weight.

Step 2. Secure the collection surface in the field. Lay the ground sheet out fully extended. Lay the sheet on the ground so that as the sheet is removed from the field the manure applied over the surface can be collected easily in its folds. If dirty sheets are being used for additional tests turn the dirty side up so that any manure residue included in the tare weight is not lost. Weights of stone metal or earth clods will be required to hold the ground sheet on the soil surface. A small breeze can easily fold the sheet or tractor wheels and forceful applications of manure can move it.

Pans are not as easily affected by wind, but may be moved by forceful streams from side outlet manure spreaders. Evenly space pans in a row perpendicular to the spreader's path. Pans are easily crushed by tires; allow for wheel tracks and adhere to the path provided. Placing flags at designated wheel tracks helps avoid pan damage.

Step 3. Spread manure over the collection area. Spread manure over and near the ground sheet or pans in a manner that best duplicates the spreading pattern you plan for the field. With rear outlet spreaders, make three passes: the first pass directly over the center of the collection area and the remaining two passes on the opposite sides of the first pass with an overlap. With side outlet spreaders, locate a first pass off of, but along one edge of, the collection area. Follow with subsequent passes farther away from the collection area and at the intended overlap until manure no longer reaches the surface.

In all cases, start spreading manure far enough before the collection area to ensure that the spreader is functioning. If a ground sheet is folded or a pan is moved during a spread pass, investigate its condition before continuing with the test. Folded edges can be straightened without major loss of accuracy. If more than one-fourth of the surface has moved and did not receive manure, the test should be conducted again with a newly weighed sheet. Pans that have been crushed but retain the applied manure can still be used. Return moved pans to their original position.

Step 4. Collect and weigh the manure. Remove weights used to hold the ground sheet in place. Fold the ground sheet and manure in short sections from all sides and corners inward to avoid losing any manure. A 10-foot by 10-foot sheet folded with wet manure may weigh as much as 150 pounds and tends to slip around when carried; place it in a feed tub or other container for easier handling.

Pans are easy to handle and will usually weigh less than 4 pounds each. Careful handling is required to avoid spilling liquid manure.

Select scales capable of accurately weighing the type and quantity of manure collected. A single pan may collect from 2 ounces to 4 pounds and can be weighed with a kitchen scale. A ground sheet may collect from 10 to 50 pounds with application rates of less than 10 tons per acre. A ground sheet can be weighed with spring-tension or milk scales. A ground sheet with application rates greater than 10 tons per acre will require a platform balance with a capacity of 50 to 150 pounds or greater.

The weight indicated on the scale will include the tare weight of the ground sheet or pan as well as that of any container used to hold the ground sheet or pan during weighing. Subtract the tare weights from the total weight to determine the net weight of the manure collected.

Step 5. Compute the application rate. The number of steps and the procedure used to compute the application rate depend on the method of collection and the units per acre.

Ground sheet to tons per acre. Divide the net pounds of manure collected by the area of the ground sheet to obtain the manure application rate in pounds of manure per square foot. Multiply the result by 43,560 and then divide by 2,000 to convert to tons per acre.

Pans to tons per acre. Add the net weights of manure collected in individual pans to determine the total weight of manure collected. Divide the total manure weight by the total collection area to obtain pounds of manure per square foot. Multiply the result by 43,560 and divide by 2000 to obtain tons per acre.

Pans to gallons per acre. If working with weight from pans to determine liquid applications in gallons per acre, make an additional measurement to calculate the weight per gallon of manure. Fill a 5-gallon bucket with liquid manure of the same consistency of that applied. Weigh the bucket of manure and subtract the tare weight of the bucket to determine the net weight of 5 gallons of manure. Divide the result by 5 to determine the weight in pounds per gallon. Follow the procedure for "Pans to tons per acre" through obtaining pounds of manure per square foot. Then multiply by 43,560 and divide by pounds per gallon to obtain gallons per acre.

Uniformity testing

The results of nonuniform manure spreading are often indicated by the lush, green growth within the spreader paths and the not-so-lush growth between spreader paths. This occurs because more manure was deposited in and near the spreader path than farther away from the path. Uniform application can be obtained by adjusting the application overlap. The amount of overlap necessary can be determined by a uniformity test. As you complete the steps in this uniformity test, record your calculations on Worksheet 4, Uniformity Testing.

The test procedure is identical to the weight-area calibration method, using pans or a series of 24-inch by 24-inch ground sheet sheets laid out with equal spacing across two spreader path widths. After the manure is applied, each pan or sheet is compared with the others. Uniformity can be recorded when manure is spread to determine the application rate.

If all containers collect about the same amount of manure during a test, the application is uniform; if some collect more than others, the overlap should be adjusted. High application in the center of paths and low application between paths indicate a need to increase the overlap by decreasing the path spacing. Higher application between paths than within paths indicates a need to decrease overlap by increasing path spacing.

Shortcuts

Developing a range of application rates for different manure spreader speeds can be simplified if the spreader is PTO-powered and the tractor or truck is equipped with a groundspeed indicator. Conduct one test at low groundspeed and one at high groundspeed, maintaining the same spreader setting and PTO speed for both tests. Plot these two application rates on a graph of groundspeed versus application and draw a straight line connecting the two points. The application rate available at intermediate groundspeeds can then be estimated from the graph. Conducting additional high-low tests at different settings or at different PTO speeds will define a full range of available application rates.

If solid or semisolid manure changes moisture content from season to season, the weight capacity in the spreader and the application rate by weight will change. Adjust previously calibrated spreader conditions for these changes by determining the bulk density of the new manure. To estimate the field application rate for the new manure for a particular speed and spreader setting, multiply the old application rate by the new bulk density and then divide by the old bulk density. This calculation eliminates the need to repeat the field test every time manure properties change.

Summary

By measuring the application rate and uniformity of manure spreading, a farmer can be sure of the amount of manure nutrients applied to a crop. This measurement, called calibration, can be accomplished with a little time and a few dollars. For further information, contact your county Extension office.

Source—Adapted from Calibrating Manure Spreaders, Fact Sheet 419, Cooperative Extension Service, University of Maryland System, H.L. Brodie, extension agricultural engineer, and G.L. Smith, extension agricultural engineer, Department of Agricultural Engineering, University of Maryland at College Park, Published 1985-86, revised 1990-91.

Worksheet 13A-1—Manure Spreader Capacity

A. Description of spreader.

Manufacturer ______________________ Model ______________________

Type: ❑ box ❑ open-tank ❑ liquid-tank

Capacity: This information is available from your dealer or owner's manual.

Older models: bushels x 1.24 = cubic feet

Box or open-tank: ________ ft^3 struck load ________ ft^3 heaped load

Liquid-tank: ________ gal

B. For open-tank and box spreaders, determine the pounds per cubic foot of manure and the weight capacity of the spreader.

Type of manure: ❑ solid ❑ semisolid

1. Determine manure density using a 5-gallon bucket.

	Trial 1	Trial 2	Trial 3	
a. Empty bucket weight or tare weight	______	______	______	lb
b. Bucket filled with manure	______	______	______	lb
c. Net weight of manure (b – a)	______	______	______	lb
d. Manure density [(c x 3) ÷ 2]	______	______	______	lb/ft^3
e. Average of three trials	______ lb/ft^3			

2. Weight capacity of the spreader.

	Struck load	Heaped load
Spreader capacity	______ ft^3	______ ft^3
x	x	x
Manure density	______ lb/ft^3	______ lb/ft^3
=	=	=
Load weight	______ lb	______ lb
÷	÷	÷
2,000	______ tons	______ tons

Worksheet 13A-2—Load-Area Calibration

Liquid-Tank Spreaders (Liquid Manure)

1. Determine the capacity of the manure spreader. ________ gal
2. Spread at least three full loads at the desired speed, spreader setting and overlap.
3. Measure the area of the spread.
   a. Spread manure area width ________ ft
   b. Spread manure area length ________ ft
   c. Spread area (a x b) ________ ft^2
   d. Spread area in acres (c ÷ 43,560) ________ acres
4. Compute the application rate.
   e. Number of loads spread
   f. Capacity per load ________ gal
   g. Total manure spread (e x f) ________ gal
   h. Application rate (g ÷ d) ________ gal/acre

Box and Open-Tank Spreaders (Solid and Semisolid Manure)

1. Determine the capacity of the manure spreader. ________ tons
2. Spread at least three full loads at the desired speed, spreader setting and overlap.
3. Measure the area of the spread.
   a. Spread manure area width ________ ft
   b. Spread manure area length ________ ft
   c. Spread area (a x b) ________ ft^2
   d. Spread area in acres (c ÷ 43,560) ________ acres
4. Compute the application rate.
   e. Number of loads spread ________
   f. Capacity per load ________ tons
   g. Total manure spread (e x f) ________ tons
   h. Application rate (g ÷ d) ________ tons/acre

Nutrient application = tons/acre x pounds of nutrient per ton
or gallons/acre x pounds of nutrient per gallon

Worksheet 13A-3—Weight-Area Calibration

1. Select a manure collection surface.
   a. Determine collection area
   Ground sheet:
   width ________ ft x length ________ ft = area ________ ft^2
   Pans:
   pan width ________ inch x pan length ________ inch ÷ 144 = pan area ________ ft^2
   pan area ________ x number of pans ________ = collection area ________ ft^2

2. Secure ground sheet or pans.

3. Spread manure over the collection area.

	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	
Forward speed, gear or throttle setting	________	________	________	________	________	
PTO speed	________	________	________	________	________	
Spreader setting	________	________	________	________	________	

4. Collect and weigh the manure and compute the application rate.

	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	
a. Tare weight of sheet or pan andweighing container	________	________	________	________	________	lb
b. Gross weight of sheet or pan, collected manure and weighing container	________	________	________	________	________	lb
c. Net weight of manure (b – a)	________	________	________	________	________	lb
d. Area of sheet or pans	________	________	________	________	________	ft^2
e. Application rate (c ÷ d)	________	________	________	________	________	lb/ft^2
Ground sheet or pans to tons per acre.						
f. Application rate [(e x 43,560) ÷ 2,000]	________	________	________	________	________	ton/ac
Pans to gallons per acre.						
g. Tare weight of a 5-gallon bucket	________	________	________	________	________	lb
h. Weight of a 5-gallon bucket full of manure	________	________	________	________	________	lb
i. Net weight of 1 gallon of manure [(h - g) - 5]	________	________	________	________	________	lb/gal
j. Application rate [(e x 43,560) ÷ g]	________	________	________	________	________	gal/ac

Nutrient application = tons/acre x pounds of nutrient per ton
or gallons/acre x pounds of nutrient per gallon.

Worksheet 13A-4—Uniformity Testing

1. Layout a line of small ground sheet sheets or pans of equal size, equally spaced across two spreader path widths
   a. Determine the pan or sheet area.
      width ________ inch x length ________ inch ÷ 144 = area ________ ft²

2. Spread manure over the collection area.

   Forward speed, gear or throttle setting ________

   PTO speed ________

   Spreader setting ________

	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	
a. Tare weight of sheet or pan and weighing container	______	______	______	______	______	______	______	lb
b. Gross weight of sheet or pan, collected manure and weighing container	______	______	______	______	______	______	______	lb
c. Net weight of manure (b – a)	______	______	______	______	______	______	______	lb
d. Area of sheet or pans	______	______	______	______	______	______	______	ft²
e. Application rate (c ÷ d)	______	______	______	______	______	______	______	lb/ft²

Uniformity is achieved when all pans or sheets collect the same amount of manure. To improve uniformity, adjust spreader paths to increase or decrease overlap.

Published 1985-86
Revised 1990-91

Leak Inspection Log for Application Equipment

Form 12-C

Date & Time	Inspected by (Name)	Equipment	Leak Repair	Notes

Work with your equipment dealer for suggestions on inspection and regular maintenance for specific equipment.
If the last column on **Form 12-A** is marked "yes," provide information on this form.