TABLE 1

EXISTING HERD SUMMARY
EBERT DAIRY ENTERPRISES, LLC
ALGOMA, WISCONSIN

Livestock Type	*Numbers*	*Average Weight (lb)*	*Animal Equivalency Factor* [1]	*AU* [2]	*Location and Housing Type*
Main Dairy					
Milking Cows	2,567	1,300	1.4	3,594	Main Dairy Freestall Barns
Dry Cows	90	1,400	1.4	126	Main Dairy Freestall Barns
Heifers	90	800 - 1,200	1.1	99	Main Dairy Freestall Barns
Sub-total	**2,747**			**3,819**	
Heifer Facility					
Heifers	418	800 - 1,200	1.1	460	Heifer Facility Barnyard and Outdoor Lot
Heifers	185	400 - 800	0.6	111	Heifer Facility Barnyard and Outdoor Lot
Calves	310	0 - 400	0.2	62	Heifer Facility Calf Barns
Sub-total	**913**			**633**	
Longfellow Farm					
Dry Cows	335	1,400	1.4	469	Longfellow Farm Freestall Barn
Heifers	1,049	800 - 1,200	1.1	1,154	Longfellow Farm Freestall Barn
Heifers	582	400 - 800	0.6	349	Longfellow Farm Freestall Barn
Calves	88	0 - 400	0.2	18	Longfellow Farm Calf Barn
Sub-total	**2,054**			**1,990**	
TOTAL	**5,714**			**6,441**	

Notes:

(1) AU - Animal equivalency factor based on WDNR NR 243

(2) AU - Animal units, calculated in accordance with WDNR NR 243

TABLE 2

EXISTING MANURE QUANTITY SUMMARY
EBERT DAIRY ENTERPRISES, LLC
ALGOMA, WISCONSIN

Livestock Type	*Numbers*	*Average Weight (lb)*	*Liquid (1) (gal/d)*	*Liquid (2) (gal/year)*	*Solids Separation (3) (gal/year)*	*Solids Separation (4) (tons/year)*	*Total Liquid to Storage (gal/year)*	*Solid (lb/d)*	*Solid (tons/yr)*
Main Dairy									
Milking Cows	2,567	1,300	30	28,108,650	2,023,823	8,298	26,084,827	--	--
Dry Cows	90	1,400	23	755,550	54,400	223	701,150	--	--
Heifers	90	800 - 1,200	18	591,300	42,574	175	548,726	--	--
Sub-total	**2,747**			**29,455,500**	**2,120,796**	**8,695**	**27,334,704**		**0**
Heifer Facility									
Heifers	418	800 - 1,200	--	--	--	--	--	82	6,255
Heifers	185	400 - 800	--	--	--	--	--	65	2,195
Calves	310	0 - 400	--	--	--	--	--	21	1,188
Sub-total	**913**			0	0	0	0		**9,638**
Longfellow Farm									
Dry Cows	335	1,400	23	2,812,325	--	--	--	--	--
Heifers	1,049	800 - 1,200	18	6,891,930	--	--	--	--	--
Heifers	582	400 - 800	13	2,761,590	--	--	--	--	--
Calves	88	0 - 400	--	--	--	--	--	21	337
Sub-total	**2,054**			**12,465,845**	0	0	**12,465,845**		**337**
Silage Leachate (5) Main Dairy							**149,600**		
Runoff from Feed Storage Area (6) Main Dairy							**818,327**		
Silage Leachate (7) Longfellow Farm							**108,355**		
Runoff from Feed Storage Area and Concrete Barnyards (8) Longfellow Farm							**70,087**		
Total	**5,714**			**41,921,345**	**2,120,796**	**8,695**	**40,946,918**		**9,975**

Notes:

(1) Liquid Manure Estimate based on farm production records
(2) Bedding and other by-products not included
(3) Manure contains 12% solids and separation efficiency is 60%
(4) One gallon of separated solids equals 0.0041 tons
(5) Leachate volume based on 0.5 cubic feet per ton of stored feed for 40,000 tons of feed
(6) Based on Wisconsin USDA-NRCS Feed Storage Runoff Spreadsheet and CPS 629. Values derived from collection of 0.20 inches of first flush precipitation ru
(7) Leachate volume based on 0.5 cubic feet per ton of stored feed for 29,000 tons of feed (Calculations by Roach & Associates)
(8) Based on Wisconsin USDA-NRCS Feed Storage Runoff Spreadsheet and CPS 629. Values derived from 100% collection of precipitation runoff from the feed area and concrete barnyards (Calculations by Roach & Associates)

TABLE 3

PROPOSED HERD SUMMARY
EBERT DAIRY ENTERPRISES, LLC
ALGOMA, WISCONSIN

Livestock Type	*Numbers*	*Average Weight (lb)*	*Animal Equivalency Factor* [1]	*AU* [2]	*Location and Housing Type*
Main Dairy					
Milking Cows	3,200	1,300	1.4	4,480	Main Dairy Freestall Barns
Dry Cows	500	1,400	1.4	700	Main Dairy Freestall Barns
Heifers	200	800 - 1,200	1.1	220	Main Dairy Freestall Barns
Heifers	600	400 - 800	0.6	360	Main Dairy Heifer Barns
Calves	600	0 - 400	0.2	120	Main Dairy Heifer Barns
Sub-total	**5,100**			**5,880**	
Heifer Facility					
Heifers	200	400 - 800	0.6	120	Heifer Facility Calf Barns
Calves	310	0 - 400	0.2	62	Heifer Facility Calf Barns
Sub-total	**510**			**182**	
Longfellow Farm					
Heifers	1,800	800 - 1,200	1.1	1,980	Longfellow Farm Freestall Barns
Heifers	1,000	400 - 800	0.6	600	Longfellow Farm Freestall Barns
Sub-total	**2,800**			**2,580**	
TOTAL	**8,410**			**8,642**	

Notes:

(1) AU - Animal equivalency factor based on WDNR NR 243

(2) AU - Animal units, calculated in accordance with WDNR NR 243

TABLE 4

PROPOSED MANURE QUANTITY SUMMARY
EBERT DAIRY ENTERPRISES, LLC
ALGOMA, WISCONSIN

Livestock Type	*Numbers*	*Average Weight (lb)*	*Liquid (1) (gal/d)*	*Liquid (2) (gal/year)*	*Solids Separation (3) (gal/year)*	*Solids Separation (4) (tons/year)*	*Total Liquid to Storage (gal/year)*	*Solid (lb/d)*	*Solid (tons/yr)*
Main Dairy									
Milking Cows	3,200	1,300	30	35,040,000	2,522,880	10,344	32,517,120	--	--
Dry Cows	500	1,400	23	4,197,500	302,220	1,239	3,895,280	--	--
Heifers	200	800 - 1,200	18	1,314,000	94,608	388	1,219,392	--	--
Heifers	600	400 - 800	--	--	--	--	--	65	7,118
Calves	600	0 - 400	--	--	--	--	--	21	2,300
Sub-total	**5,100**			**40,551,500**	**2,919,708**	**11,971**	**37,631,792**		**9,417**
Heifer Facility									
Heifers	200	400 - 800	--	--	--	--	--	65	2,373
Calves	310	0 - 400	--	--	--	--	--	21	1,188
Sub-total	**510**			0	0	0	0		**3,561**
Longfellow Farm									
Heifers	1,800	800 - 1,200	18	11,826,000	--	--	--	--	--
Heifers	1000	400 - 800	13	4,745,000	--	--	--	--	--
Sub-total	**2,800**			**16,571,000**	0	0	**16,571,000**		**0**
Silage Leachate(5) Main Dairy							**149,600**		
Runoff from Feed Storage Area(6) Main Dairy							**818,327**		
Silage Leachate(7) Longfellow Farm							**108,355**		
Runoff from Feed Storage Area and Concrete Barnyards(8) Longfellow Farm							**70,087**		
Total	**8,410**			**57,122,500**	**2,919,708**	**11,971**	**55,349,161**		**12,978**

Notes:
(1) Liquid Manure Estimate based on farm production records
(2) Bedding and other by-products not included
(3) Manure contains 12% solids and separation efficiency is 60%
(4) One gallon of separated solids equals 0.0041 tons
(5) Leachate volume based on 0.5 cubic feet per ton of stored feed for 40,000 tons of feed
(6) Based on Wisconsin USDA-NRCS Feed Storage Runoff Spreadsheet and CPS 629. Values derived from collection of 0.20 inches of first flush precipitation runof
(7) Leachate volume based on 0.5 cubic feet per ton of stored feed for 29,000 tons of feed (Calculations by Roach & Associates)
(8) Based on Wisconsin USDA-NRCS Feed Storage Runoff Spreadsheet and CPS 629. Values derived from 100% collection of precipitation runoff from the feed sto area and concrete barnyards (Calculations by Roach & Associates)

Manure Sampling Protocol

The following is the manure sampling procedure and labeling protocols that are to be followed each time manure is removed from a sampling point to be land applied. No sample shall be taken when manure is transferred between sampling points.

Manure Sampling Protocol for Liquid Manure

- Manure shall be adequately agitated so that the mixture is uniform before being loaded into the tankers.
- Multiple subsamples will be taken from the manure that is removed from a sampling point.
- The samples shall be commingled into a bucket and thoroughly mixed.
- From this mixture fill a sample container ¾ full to allow room for gas expansion.
- The date and sample point shall be recorded on the lid of the sample container and the appropriate information sheets shall be completed.
- The sample shall be stored in the freezer at the farm office.
- The samples will be submitted to the lab for analysis.

Manure Sampling Protocol for Solid Manure

- Collect manure from a full manure spreader or stack using a small shovel or wear plastic gloves to collect subsamples.
- Collect 5 to 8 subsamples from various locations in the spreader or manure stack. Avoid large pieces or clumps of bedding.
- The subsamples shall be commingled into a bucket and thoroughly mixed.
- From this mixture fill a sample container ¾ full to allow room for gas expansion.
- The date and sample point shall be recorded on the lid of the sample container and the appropriate information sheets shall be completed.
- The sample shall be stored in the freezer at the farm office.
- The samples will be submitted to the lab for analysis.

NOTE: Samples should be completely frozen and mailed early in the week to prevent microbial activity which can rupture the sample container.

Manure Testing Analytical Procedures

- All manure samples will be submitted to an approved laboratory that follows the manure analysis procedures outlined in Wisconsin Administrative Code ATCP 50.50 (8). Approved laboratories must participate in the manure analysis proficiency program administered by the Minnesota Department of Agriculture or a equivalent program administered by the University of Wisconsin Soil Analysis Laboratory.
- Manure analysis must be performed according to the procedures outlined in UWEX Publication A3769 – Recommended Methods of Manure Analysis.

Ebert Enterprises, LLC Manure Sampling Test Results

Liquid Manure Test Results From Lagoon 2

Sample Number	Sample Type	WPDES Permit Sample Point	Date Sampled	Storage sytem	Dry Matter %	Nitrogen Injected Total Nutrients lbs/1000	Nitrogen Surf App. Total Nutrients lbs/1000	Phosphorus P2O5 Total Nutrients lbs/1000	Potassium K2O Total Nutrients lbs/1000	Sulfur S Total Nutrients lbs/1000	Nitrogen Injected 1st yr Nutrients lbs/1000	Nitrogen Surf App. 1st yr Nutrients lbs/1000	Phosphorus P2O5 1st yr Nutrients lbs/1000	Potassium K2O 1st yr Nutrients lbs/1000	Sulfur S 1st yr Nutrients lbs/1000	Nitrogen Injected 2nd yr Nutrients lbs/1000	Nitrogen Surf App. 2nd yr Nutrients lbs/1000	Phosphorus P2O5 2nd yr Nutrients lbs/1000	Potassium K2O 2nd yr Nutrients lbs/1000	Sulfur S 2nd yr Nutrients lbs/1000	Nitrogen Injected 3rd yr Nutrients lbs/1000	Nitrogen Surf App. 3rd yr Nutrients lbs/1000	Phosphorus P2O5 3rd yr Nutrients lbs/1000	Potassium K2O 3rd yr Nutrients lbs/1000	Sulfur S 3rd yr Nutrients lbs/1000
3026	Grab	3	8/28/08	LIQ	4.44%	18.34	18.34	6.38	17.31	2	7.34	5.5	3.83	13.84	1.2	9.17	7.34	4.46	15.58	1.4	10.09	8.25	4.78	16.44	1.5
3603	Grab	3	4/15/09	LIQ	4.26%	21.5	21.5	11.99	16.45	2.48	8.6	6.45	7.2	13.16	1.49	10.75	8.6	8.39	14.81	1.73	11.82	9.67	8.99	15.63	1.86
3604	Grab	3	4/15/09	LIQ	5.17%	14.69	14.69	14.24	18.79	3.02	5.88	4.41	8.54	15.03	1.81	7.35	5.88	9.97	16.91	2.11	8.08	6.61	10.68	17.85	2.26
4577	Grab	3	4/27/10	LIQ	1.62%	14.03	14.03	2.36	10.82	1.1	5.61	4.21	1.42	8.65	0.66	7.01	5.61	1.66	9.74	0.77	7.71	6.31	1.77	10.28	0.83
4766	Grab	3	8/25/10	LIQ	3.59%	24.24	24.24	4.77	15.12	1.47	9.69	7.27	2.86	12.09	0.88	12.12	9.69	3.34	13.61	1.03	13.33	10.91	3.57	14.36	1.1
13966	Grab	3	10/21/10	LIQ	4.40%	21.58	21.58	7.19	15.08	1.86	8.63	6.47	4.32	12.06	1.12	10.79	8.63	5.03	13.57	1.3	11.87	9.71	5.39	14.32	1.4
15708	Grab		4/13/11	LIQ	4.30%	16.6	16.6	9.24	15.97	2.32	6.64	4.98	5.54	12.78	1.39	8.3	6.64	6.46	14.38	1.62	9.13	7.47	6.93	15.18	1.74
15709	Grab		4/14/11	LIQ	4.20%	24.9	24.9	10.46	17.69	2.44	9.96	7.47	6.27	14.16	1.46	12.45	9.96	7.32	15.93	1.71	13.7	11.21	7.84	16.81	1.83
16266	Grab		6/7/11	LIQ	4.40%	20.75	20.75	9.62	17.75	2.3	8.3	6.23	5.77	14.2	1.38	10.38	8.3	6.73	15.97	1.61	11.41	9.34	7.21	16.86	1.73
16267	Grab		6/7/11	LIQ	4.60%	21.58	21.58	9.09	17.59	2.29	8.63	6.47	5.46	14.07	1.37	10.79	8.63	6.37	15.83	1.6	11.87	9.71	6.82	16.71	1.72
16854	Grab		8/1/11	LIQ	3.60%	17.43	17.43	7.53	17.53	1.76	6.97	5.23	4.52	14.03	1.06	8.72	6.97	5.27	15.78	1.23	9.59	7.84	5.85	16.66	1.32
19272	Grab		11/14/11	LIQ	4.50%	19.92	19.92	8.64	22.41	2.28	7.97	5.98	5.18	17.93	1.37	9.96	7.97	6.05	20.17	1.59	10.96	8.96	6.48	21.29	1.71
19273	Grab		11/16/11	LIQ	5.10%	22.41	22.41	8.24	20.83	2.33	8.96	6.72	4.94	16.66	1.4	11.21	8.96	5.77	18.74	1.63	12.33	10.08	6.18	19.79	1.75
19274	Grab		12/19/11	LIQ	2.80%	11.62	11.62	2.45	10.29	0.81	4.65	3.49	1.47	8.23	0.49	5.81	4.65	1.71	9.26	0.57	6.39	5.23	1.84	9.78	0.61
19275	Grab		12/20/11	LIQ	7.00%	14.11	14.11	7.85	13.53	1.74	5.64	4.23	4.71	10.82	1.05	7.06	5.64	5.49	12.17	1.22	7.76	6.35	5.89	12.85	1.31
19276	Grab		12/28/11	LIQ	5.10%	21.58	21.58	7.37	15.85	2.24	8.63	6.47	4.42	12.68	1.35	10.79	8.63	5.16	14.26	1.57	11.87	9.71	5.53	15.06	1.68
13968	Grab	3	10/18/10	LIQ	4.00%	19.09	19.09	8.21	15.7	2.06	7.64	5.73	4.93	12.56	1.24	9.55	7.64	5.75	14.13	1.44	10.5	8.59	6.16	14.91	1.54
Averages					**4.30%**	**19.08059**	**19.081**	**7.978235**	**16.3947**	**2.0294**	**7.6318**	**5.7241**	**4.787059**	**13.1147**	**1.2188**	**9.5418**	**7.6318**	**5.584118**	**14.7553**	**1.4194**	**10.495**	**8.5853**	**5.98294**	**15.5753**	**1.523**

Stage 2

Sample Number	Sample Type	WPDES Permit Sample Point	Date Sampled	Storage sytem	Dry Matter %	Nitrogen Injected Total Nutrients lbs/ton	Nitrogen Surf App. Total Nutrients lbs/ton	Phosphorus P2O5 Total Nutrients lbs/ton	Potassium K2O Total Nutrients lbs/ton	Sulfur S Total Nutrients lbs/ton	Nitrogen injected 1st yr Nutrients lbs/ton	Nitrogen Surf App. 1st yr Nutrients lbs/ton	Phosphorus P2O5 1st yr Nutrients lbs/ton	Potassium K2O 1st yr Nutrients lbs/ton	Sulfur S 1st yr Nutrients lbs/ton	Nitrogen injected 2nd yr Nutrients lbs/ton	Nitrogen Surf App. 2nd yr Nutrients lbs/ton	Phosphorus P2O5 2nd yr Nutrients lbs/ton	Potassium K2O 2nd yr Nutrients lbs/ton	Sulfur S 2nd yr Nutrients lbs/ton	Nitrogen Injected 3rd yr Nutrients lbs/ton	Nitrogen Surf App. 3rd yr Nutrients lbs/ton	Phosphorus P2O5 3rd yr Nutrients lbs/ton	Potassium K2O 3rd yr Nutrients lbs/ton	Sulfur S 3rd yr Nutrients lbs/ton
20306	Grab	3	4/24/12	Liq	4.80%	21.58	21.58	8.67	17.98	2.43	8.63	6.47	5.2	14.38	1.46	10.79	8.63	6.07	16.18	1.7	11.87	9.71	6.5	17.08	1.82
20305	Grab	3	4/14/12	Liq	5.30%	24.9	24.9	9.17	18.05	2.6	9.96	7.47	5.5	14.44	1.56	12.45	9.96	6.42	16.25	1.82	13.7	11.21	6.88	17.15	1.95
20998	Grab	3	10/24/12	Liq	4.60%	24.9	24.9	9.18	18.78	2.21	9.96	7.47	5.51	15.03	1.33	12.45	9.96	6.43	16.91	1.55	13.7	11.21	6.89	17.85	1.66
20999	Grab	3	10/25/12	Liq	4.60%	24.9	24.9	9.18	18.6	2.21	9.96	7.47	5.51	14.88	1.33	12.45	9.96	6.43	16.74	1.55	13.7	11.21	6.89	17.67	1.66
20304	Grab	3	4/13/12	Liq	5.30%	24.9	24.9	8.97	18.74	2.55	9.96	7.47	5.38	14.99	1.53	12.45	9.96	6.28	16.87	1.79	13.7	11.21	6.72	17.8	1.91
Averages					**4.92%**	**24.24**	**24.24**	**9.03**	**18.43**	**2.40**	**9.69**	**7.27**	**5.42**	**14.74**	**1.44**	**12.12**	**9.69**	**6.33**	**16.59**	**1.68**	**13.33**	**10.91**	**6.78**	**17.51**	**1.80**

Stage 3

Sample Number	Sample Type	WPDES Permit Sample Point	Date Sampled	Storage sytem	Dry Matter %	Nitrogen Injected Total Nutrients lbs/ton	Nitrogen Surf App. Total Nutrients lbs/ton	Phosphorus P2O5 Total Nutrients lbs/ton	Potassium K2O Total Nutrients lbs/ton	Sulfur S Total Nutrients lbs/ton	Nitrogen Injected 1st yr Nutrients lbs/ton	Nitrogen Surf App. 1st yr Nutrients lbs/ton	Phosphorus P2O5 1st yr Nutrients lbs/ton	Potassium K2O 1st yr Nutrients lbs/ton	Sulfur S 1st yr Nutrients lbs/ton	Nitrogen Injected 2nd yr Nutrients lbs/ton	Nitrogen Surf App. 2nd yr Nutrients lbs/ton	Phosphorus P2O5 2nd yr Nutrients lbs/ton	Potassium K2O 2nd yr Nutrients lbs/ton	Sulfur S 2nd yr Nutrients lbs/ton	Nitrogen Injected 3rd yr Nutrients lbs/ton	Nitrogen Surf App. 3rd yr Nutrients lbs/ton	Phosphorus P2O5 3rd yr Nutrients lbs/ton	Potassium K2O 3rd yr Nutrients lbs/ton	Sulfur S 3rd yr Nutrients lbs/ton
20303	Grab	4	5/24/12	Liq	3.40%	19.09	19.09	7.17	15.51	1.92	7.64	5.73	4.3	12.41	1.15	9.55	7.64	5.02	13.96	1.34	10.5	8.59	5.38	14.73	1.44
20307	Grab	4	5/23/12	Liq	4.50%	18.26	18.26	7.87	17.39	2.17	7.3	5.48	4.72	13.91	1.3	9.13	7.3	5.51	15.65	1.52	10.04	8.22	5.9	16.52	1.62
22027	Grab	4	11/5/12	Liq	3.40%	14.94	14.94	7.04	17.95	1.72	5.98	4.48	4.23	14.36	1.03	7.47	5.98	4.93	16.15	1.2	8.22	6.72	5.28	17.05	1.29
22028	Grab	4	11/5/12	Liq	5.40%	22.41	22.41	9.85	20.22	2.36	8.96	6.72	5.91	16.18	1.43	11.21	8.96	6.9	18.2	1.66	12.33	10.08	7.39	19.21	1.78
22029	Grab	4	11/6/12	Liq	3.40%	16.6	16.6	6.66	16.9	1.64	6.64	4.98	3.99	13.52	0.98	8.3	6.64	4.66	15.21	1.15	9.13	7.47	4.99	16.05	1.23
Averages					**4.02%**	**18.26**	**18.26**	**7.72**	**17.59**	**1.97**	**7.30**	**5.48**	**4.63**	**14.08**	**1.18**	**9.13**	**7.30**	**5.40**	**15.83**	**1.37**	**10.04**	**8.22**	**5.79**	**16.71**	**1.47**

Ebert Enterprises, LLC Manure Sampling Test Results

Fiber Solid Manure Test Results

Sample Number	Sample Type	WPDES Permit Sample Point	Date Sampled	Storage sytem	Dry Matter %	Nitrogen Injected Total Nutrients lbs/ton	Nitrogen Surf App. Total Nutrients lbs/ton	Phosphorus P2O5 Total Nutrients lbs/ton	Potassium K2O Total Nutrients lbs/ton	Sulfur S Total Nutrients lbs/ton	Nitrogen Injected 1st yr Nutrients lbs/ton	Nitrogen Surf App. 1st yr Nutrients lbs/ton	Phosphorus P2O5 1st yr Nutrients lbs/ton	Potassium K2O 1st yr Nutrients lbs/ton	Sulfur S 1st yr Nutrients lbs/ton	Nitrogen Injected 2nd yr Nutrients lbs/ton	Nitrogen Surf App. 2nd yr Nutrients lbs/ton	Phosphorus P2O5 2nd yr Nutrients lbs/ton	Potassium K2O 2nd yr Nutrients lbs/ton	Sulfur S 2nd yr Nutrients lbs/ton	Nitrogen Injected 3rd yr Nutrients lbs/ton	Nitrogen Surf App. 3rd yr Nutrients lbs/ton	Phosphorus P2O5 3rd yr Nutrients lbs/ton	Potassium K2O 3rd yr Nutrients lbs/ton	Sulfur S 3rd yr Nutrients lbs/ton
3025	Grab	5	8/28/08	Sol	18.89%	5.84	5.84	1.69	4.37	0.8	2.34	1.75	1.01	3.5	0.48	2.92	2.34	1.18	3.94	0.56	3.21	2.63	1.27	4.15	0.6
3027	Grab	5	8/28/08	Sol	32.19%	9.41	9.41	2.49	5.54	1.34	3.76	2.82	1.5	4.43	0.8	4.71	3.76	1.75	4.99	0.94	5.18	4.24	1.87	5.26	1
3501	Grab	5	2/23/09	Sol	19.00%	8.02	8.02	1.89	4.18	0.84	3.21	2.41	1.13	3.34	0.5	4.01	3.21	1.32	3.76	0.59	4.41	3.61	1.42	3.97	0.63
16856	Grab		8/1/11	Sol	26.30%	6.4	6.4	2.89	6.06	1.05	2.56	1.92	1.73	4.85	0.63	3.2	2.56	2.02	5.45	0.74	3.52	2.88	2.17	5.76	0.79
16857	Grab		8/1/11	Sol	21.00%	6	6	2.21	4.49	0.84	2.4	1.8	1.33	3.59	0.5	3	2.4	1.55	4.04	0.59	3.3	2.7	1.66	4.26	0.63
19269	Grab		12/15/11	Sol	22.10%	7.4	7.4	3.04	4.77	1.02	2.96	2.22	1.82	3.82	0.61	3.7	2.96	2.13	4.3	0.71	4.07	3.33	2.28	4.53	0.76
13969	Grab	5	10/21/10	Sol	23.00%	8.2	8.2	2.74	4.36	1.01	3.28	2.46	1.64	3.49	0.61	4.1	3.28	1.92	3.92	0.71	4.51	3.69	2.05	4.14	0.76
Averages					23.21%	**7.32**	**7.32**	**2.42**	**4.82**	**0.99**	2.93	2.20	1.45	3.86	0.59	**3.66**	**2.93**	**1.70**	**4.34**	**0.69**	**4.03**	**3.30**	**1.82**	**4.58**	**0.74**

Heifer Pack Solid Manure Test Results

Sample Number	Sample Type	WPDES Permit Sample Point	Date Sampled	Storage sytem	Dry Matter %	Nitrogen Injected Total Nutrients lbs/ton	Nitrogen Surf App. Total Nutrients lbs/ton	Phosphorus P2O5 Total Nutrients lbs/ton	Potassium K2O Total Nutrients lbs/ton	Sulfur S Total Nutrients lbs/ton	Nitrogen Incorportd 1st yr Nutrients lbs/ton	Nitrogen Surf App. 1st yr Nutrients lbs/ton	Phosphorus P2O5 1st yr Nutrients lbs/ton	Potassium K2O 1st yr Nutrients lbs/ton	Sulfur S 1st yr Nutrients lbs/ton	Nitrogen Injected 2nd yr Nutrients lbs/ton	Nitrogen Surf App. 2nd yr Nutrients lbs/ton	Phosphorus P2O5 2nd yr Nutrients lbs/ton	Potassium K2O 2nd yr Nutrients lbs/ton	Sulfur S 2nd yr Nutrients lbs/ton	Nitrogen Injected 3rd yr Nutrients lbs/ton	Nitrogen Surf App. 3rd yr Nutrients lbs/ton	Phosphorus P2O5 3rd yr Nutrients lbs/ton	Potassium K2O 3rd yr Nutrients lbs/ton	Sulfur S 3rd yr Nutrients lbs/ton
2618	Grab	7	2/12/08	Sol	16.35%	4.94	4.94	0.85	4.25	0.38	1.98	1.48	0.51	3.4	0.23	2.47	1.98	0.6	3.82	0.27	2.72	2.22	0.64	4.03	0.28
3274	Grab	7	11/20/08	Sol	29.14%	22.62	22.62	8.36	16.96	2.73	9.05	6.78	5.01	13.57	1.64	11.31	9.05	5.85	15.27	1.91	12.44	10.18	6.27	16.12	2.05
3275	Grab	7	11/20/08	Sol	28.07%	11.07	11.07	5.3	9.18	1.71	4.43	3.32	3.18	7.34	1.03	5.54	4.43	3.71	8.26	1.2	6.09	4.98	3.97	8.72	1.29
3502	Grab	7	2/23/09	Sol	24.90%	17.6	17.6	5.51	10.38	1.89	7.04	5.28	3.31	8.3	1.13	8.8	7.04	3.86	9.34	1.32	9.68	7.92	4.13	9.86	1.42
20295	Grab	7	4/17/12	Sol	37.00%	9.6	9.6	8.3	15.27	2.52	3.84	2.88	4.98	12.22	1.51	4.6	3.84	5.81	13.75	1.76	5.28	4.32	6.23	14.51	1.89
13971	Grab	7	10/21/10	Sol	32.60%	7.6	7.6	2.39	11.66	0.98	3.04	2.28	1.43	9.33	0.59	3.8	3.04	1.67	10.49	0.68	4.18	3.42	1.79	11.07	0.73
Averages					28.01%	**12.24**	**12.24**	**5.12**	**11.28**	**1.70**	4.98	3.67	3.07	9.03	1.02	**6.12**	**4.90**	**3.58**	**10.16**	**1.19**	**6.73**	**5.51**	**3.84**	**10.72**	**1.28**

Solid Sand Manure Test Results From Stage 1

Sample Number	Sample Type	WPDES Permit Sample Point	Date Sampled	Storage sytem	Dry Matter %	Nitrogen Injected Total Nutrients lbs/ton	Nitrogen Surf App. Total Nutrients lbs/ton	Phosphorus P2O5 Total Nutrients lbs/ton	Potassium K2O Total Nutrients lbs/ton	Sulfur S Total Nutrients lbs/ton	Nitrogen Incorportd 1st yr Nutrients lbs/ton	Nitrogen Surf App. 1st yr Nutrients lbs/ton	Phosphorus P2O5 1st yr Nutrients lbs/ton	Potassium K2O 1st yr Nutrients lbs/ton	Sulfur S 1st yr Nutrients lbs/ton	Nitrogen Injected 2nd yr Nutrients lbs/ton	Nitrogen Surf App. 2nd yr Nutrients lbs/ton	Phosphorus P2O5 2nd yr Nutrients lbs/ton	Potassium K2O 2nd yr Nutrients lbs/ton	Sulfur S 2nd yr Nutrients lbs/ton	Nitrogen Injected 3rd yr Nutrients lbs/ton	Nitrogen Surf App. 3rd yr Nutrients lbs/ton	Phosphorus P2O5 3rd yr Nutrients lbs/ton	Potassium K2O 3rd yr Nutrients lbs/ton	Sulfur S 3rd yr Nutrients lbs/ton
20296	Grab	2	7/12/12	Sol	34.10%	6.6	6.6	2.97	5.07	1.02	2.64	1.98	1.78	4.06	0.61	3.3	2.64	2.08	4.57	0.72	3.63	2.97	2.23	4.82	0.77
20297	Grab	2	7/16/12	Sol	50.50%	5.8	5.8	2.54	4.24	0.91	2.32	1.74	1.53	3.39	0.55	2.9	2.32	1.78	3.82	0.64	3.19	2.61	1.91	4.03	0.68
	Grab			Solid																					
	Grab			Solid																					
	Grab			Solid																					
Averages					42.30%	**6.20**	**6.20**	**2.76**	**4.66**	**0.97**	2.48	1.86	1.65	3.73	0.58	**3.10**	**2.48**	**1.93**	**4.20**	**0.68**	**3.41**	**2.79**	**2.07**	**4.43**	**0.73**

Solid Sand Manure Test Results

Sample Number	Sample Type	WPDES Permit Sample Point	Date Sampled	Storage sytem	Dry Matter %	Nitrogen Injected Total Nutrients lbs/ton	Nitrogen Surf App. Total Nutrients lbs/ton	Phosphorus P2O5 Total Nutrients lbs/ton	Potassium K2O Total Nutrients lbs/ton	Sulfur S Total Nutrients lbs/ton	Nitrogen Injected 1st yr Nutrients lbs/ton	Nitrogen Surf App. 1st yr Nutrients lbs/ton	Phosphorus P2O5 1st yr Nutrients lbs/ton	Potassium K2O 1st yr Nutrients lbs/ton	Sulfur S 1st yr Nutrients lbs/ton	Nitrogen Injected 2nd yr Nutrients lbs/ton	Nitrogen Surf App. 2nd yr Nutrients lbs/ton	Phosphorus P2O5 2nd yr Nutrients lbs/ton	Potassium K2O 2nd yr Nutrients lbs/ton	Sulfur S 2nd yr Nutrients lbs/ton	Nitrogen Injected 3rd yr Nutrients lbs/ton	Nitrogen Surf App. 3rd yr Nutrients lbs/ton	Phosphorus P2O5 3rd yr Nutrients lbs/ton	Potassium K2O 3rd yr Nutrients lbs/ton	Sulfur S 3rd yr Nutrients lbs/ton
3273	Grab	3	11/20/08	Sol	49.99%	2.98	2.98	0.58	0.72	1	1.19	0.89	0.35	0.58	0.6	1.49	1.19	0.41	0.65	0.7	1.64	1.34	0.44	0.68	0.75
13967	Grab	2	11/18/10	Sol	73.80%	4.2	4.2	3.72	5.84	1.33	1.68	1.26	2.23	4.68	0.8	2.1	1.68	2.6	5.26	0.93	2.31	1.89	2.79	5.55	1
16855	Grab		8/1/11	Sol	84.70%	2	2	3.49	6.5	1.19	0.8	0.6	2.09	5.2	0.71	1	0.8	2.44	5.85	0.83	1.1	0.9	2.62	6.18	0.89
16858	Grab		8/2/11	Sol	69.70%	3.4	3.4	2.55	2.84	0.7	1.36	1.02	1.53	2.28	0.42	1.7	1.36	1.79	2.56	0.49	1.87	1.53	1.92	2.7	0.52
13970	Grab	3	11/18/10	Sol	28.50%	8.2	8.2	4.44	4.24	1.2	3.28	2.46	2.66	3.39	0.72	4.1	3.28	3.11	3.82	0.84	4.51	3.69	3.33	4.03	0.9
Averages					61.34%	**4.16**	**4.16**	**2.96**	**4.03**	**1.08**	1.66	1.25	1.77	3.23	0.65	**2.08**	**1.66**	**2.07**	**3.63**	**0.76**	**2.29**	**1.87**	**2.22**	**3.83**	**0.81**

Ebert Enterprises, LLC Manure Sampling Test Results

Solid Manure Test Results For Waste Feed

Sample Number	Sample Type	WPDES Permit Sample Point	Date Sampled	Storage system	Dry Matter %	Nitrogen Injected Total Nutrients lbs/ton	Nitrogen Surf App. Total Nutrients lbs/ton	Phosphorus P2O5 Total Nutrients lbs/ton	Potassium K2O Total Nutrients lbs/ton	Sulfur S Total Nutrients lbs/ton	Nitrogen Injected 1st yr Nutrients lbs/ton	Nitrogen Surf App. 1st yr Nutrients lbs/ton	Phosphorus P2O5 1st yr Nutrients lbs/ton	Potassium K2O 1st yr Nutrients lbs/ton	Sulfur S 1st yr Nutrients lbs/ton	Nitrogen Injected 2nd yr Nutrients lbs/ton	Nitrogen Surf App. 2nd yr Nutrients lbs/ton	Phosphorus P2O5 2nd yr Nutrients lbs/ton	Potassium K2O 2nd yr Nutrients lbs/ton	Sulfur S 2nd yr Nutrients lbs/ton	Nitrogen Injected 3rd yr Nutrients lbs/ton	Nitrogen Surf App. 3rd yr Nutrients lbs/ton	Phosphorus P2O5 3rd yr Nutrients lbs/ton	Potassium K2O 3rd yr Nutrients lbs/ton	Sulfur S 3rd yr Nutrients lbs/ton
2619	Grab	7	2/12/08	Sol	22.18%	10.46	10.46	2.27	8.88	0.74	4.18	3.14	1.36	7.1	0.44	5.23	4.18	1.59	7.99	0.52	5.75	4.71	1.7	8.43	0.56
Averages					22.18%	**10.46**	**10.46**	**2.27**	**8.88**	**0.74**	**4.18**	**3.14**	**1.36**	**7.10**	**0.44**	**5.23**	**4.18**	**1.59**	**7.99**	**0.52**	**5.75**	**4.71**	**1.70**	**8.43**	**0.56**

1st Year Average Values

MANURE NUTRIENT ANALYSIS REPORT

AgSource
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ANALYSIS FOR: EBERT ENTERPRISES
DATE PROCESSED: 07/16/2012
DATE SAMPLED: 04/17/2012
SAMPLE NUMBER: 20295
MATERIAL: Dairy
SAMPLE TYPE: HFR FARM BARNS
STORAGE SYSTEM: SOLID

ACCT: 797

RIO CREEK FEED MILL
N7295 FEED MILL LANE
ALGOMA, WI 54201

DRY MATTER, % 37.00

MOISTURE, % 63.00

	Estimated Available Nutrient Credits			
	Total Nutrients lbs/ton	In 1st Year of Application lbs/ton	If Applied 2 Consecutive Yrs lbs/ton	If Applied 3 Consecutive Yrs lbs/ton
Nitrogen (Injected)	9.60	3.84	4.80	5.28
Nitrogen(Surface Applied)	9.60	2.88	3.84	4.32
Phosphorus as P_2O_5	8.30	4.98	5.81	6.23
Potassium as K_2O	15.27	12.22	13.75	14.51
Sulfur	2.52	1.51	1.76	1.89
Estimated Value of Available Nutrients		$12.05	$14.11	$15.14

MINOR ELEMENTS *3

Calcium:	N/R	Zinc:	N/R
Magnesium:	N/R	Manganese:	N/R
Copper:	N/R	Sodium:	N/R
Iron:	N/R		

COMMENTS

*1 Applications of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.
Availability of N changes depending on application technique.
Injection or incorporation within 3 days of application results in higher N availability.

*2 Value based on commercial fertilizer costs as of 06/21/2011.
N (Urea)$0.61/lb, P2O5 (Triple Superphosphate)$0.75/lb, K2O (Potash)$0.48/lb,
S (Elemental Sulfur)$0.46/lb.

*3 If minor elements are requsted, they are reported on a 'dry matter' basis.
If ammonia, nitrate or pH are requested, they are reported on an 'as is' basis.

MANURE NUTRIENT ANALYSIS REPORT

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ANALYSIS FOR: EBERT ENTERPRISES
DATE PROCESSED: 07/16/2012
DATE SAMPLED: 07/12/2012
SAMPLE NUMBER: 20296
MATERIAL: Dairy
SAMPLE TYPE: SAND SOLIDS 1ST
STORAGE SYSTEM: SOLID

ACCT: 797

RIO CREEK FEED MILL
N7295 FEED MILL LANE
ALGOMA, WI 54201

DRY MATTER, % 34.10

MOISTURE, % 65.90

	Estimated Available Nutrient Credits			
	Total Nutrients lbs/ton	In 1st Year of Application lbs/ton	If Applied 2 Consecutive Yrs lbs/ton	If Applied 3 Consecutive Yrs lbs/ton
Nitrogen (Injected)	6.60	2.64	3.30	3.63
Nitrogen(Surface Applied)	6.60	1.98	2.64	2.97
Phosphorus as P_2O_5	2.97	1.78	2.08	2.23
Potassium as K_2O	5.07	4.06	4.57	4.82
Sulfur	1.02	0.61	0.72	0.77
Estimated Value of Available Nutrients		$4.77	$5.69	$6.15

MINOR ELEMENTS *3

Calcium:	N/R	Zinc:	N/R
Magnesium:	N/R	Manganese:	N/R
Copper:	N/R	Sodium:	N/R
Iron:	N/R		

COMMENTS

*1 Applications of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.
Availability of N changes depending on application technique.
Injection or incorporation within 3 days of application results in higher N availability.

*2 Value based on commercial fertilizer costs as of 06/21/2011.
N (Urea)$0.61/lb, P2O5 (Triple Superphosphate)$0.75/lb, K2O (Potash)$0.48/lb,
S (Elemental Sulfur)$0.46/lb.

*3 If minor elements are requsted, they are reported on a 'dry matter' basis.
If ammonia, nitrate or pH are requested, they are reported on an 'as is' basis.

MANURE NUTRIENT ANALYSIS REPORT

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ANALYSIS FOR: EBERT ENTERPRISES
DATE PROCESSED: 07/16/2012
DATE SAMPLED: 07/16/2012
SAMPLE NUMBER: 20297
MATERIAL: Dairy
SAMPLE TYPE: SAND SOLIDS 1ST
STORAGE SYSTEM: SOLID

ACCT: 797

RIO CREEK FEED MILL
N7295 FEED MILL LANE
ALGOMA, WI 54201

DRY MATTER, % 50.50

MOISTURE, % 49.50

	Estimated Available Nutrient Credits			
	Total Nutrients lbs/ton	In 1st Year of Application lbs/ton	If Applied 2 Consecutive Yrs lbs/ton	If Applied 3 Consecutive Yrs lbs/ton
Nitrogen (Injected)	5.80	2.32	2.90	3.19
Nitrogen(Surface Applied)	5.80	1.74	2.32	2.61
Phosphorus as P_2O_5	2.54	1.53	1.78	1.91
Potassium as K_2O	4.24	3.39	3.82	4.03
Sulfur	0.91	0.55	0.64	0.68
Estimated Value of Available Nutrients		$4.09	$4.88	$5.27

MINOR ELEMENTS *3

Calcium:	N/R	Zinc:	N/R
Magnesium:	N/R	Manganese:	N/R
Copper:	N/R	Sodium:	N/R
Iron:	N/R		

COMMENTS

*1 Applications of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.
Availability of N changes depending on application technique.
Injection or incorporation within 3 days of application results in higher N availability.

*2 Value based on commercial fertilizer costs as of 06/21/2011.
N (Urea)$0.61/lb, P2O5 (Triple Superphosphate)$0.75/lb, K2O (Potash)$0.48/lb,
S (Elemental Sulfur)$0.46/lb.

*3 If minor elements are requsted, they are reported on a 'dry matter' basis.
If ammonia, nitrate or pH are requested, they are reported on an 'as is' basis.

MANURE NUTRIENT ANALYSIS REPORT

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ANALYSIS FOR: EBERT ENTERPRISES
DATE PROCESSED: 07/16/2012
DATE SAMPLED: 05/24/2012
SAMPLE NUMBER: 20303
MATERIAL: Dairy
SAMPLE TYPE: 3RD STAGE LAGOON
STORAGE SYSTEM: LIQUID

ACCT: 797

RIO CREEK FEED MILL
N7295 FEED MILL LANE
ALGOMA, WI 54201

DRY MATTER, % 3.40

MOISTURE, % 96.60

	Estimated Available Nutrient Credits			
	Total Nutrients lbs/1000 gal	In 1st Year of Application lbs/1000 gal	If Applied 2 Consecutive Yrs lbs/1000 gal	If Applied 3 Consecutive Yrs lbs/1000 gal
Nitrogen (Injected)	19.09	7.64	9.55	10.50
Nitrogen(Surface Applied)	19.09	5.73	7.64	8.59
Phosphorus as P_2O_5	7.17	4.30	5.02	5.38
Potassium as K_2O	15.51	12.41	13.96	14.73
Sulfur	1.92	1.15	1.34	1.44
Estimated Value of Available Nutrients		$13.21	$15.74	$17.01

MINOR ELEMENTS *3

Calcium:	N/R	Zinc:	N/R
Magnesium:	N/R	Manganese:	N/R
Copper:	N/R	Sodium:	N/R
Iron:	N/R		

COMMENTS

*1 Applications of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.
Availability of N changes depending on application technique.
Injection or incorporation within 3 days of application results in higher N availability.

*2 Value based on commercial fertilizer costs as of 06/21/2011.
N (Urea) $0.61/lb, P2O5 (Triple Superphosphate) $0.75/lb, K2O (Potash) $0.48/lb,
S (Elemental Sulfur) $0.46/lb.

*3 If minor elements are requsted, they are reported on a 'dry matter' basis.
If ammonia, nitrate or pH are requested, they are reported on an 'as is' basis.

MANURE NUTRIENT ANALYSIS REPORT

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ANALYSIS FOR: EBERT ENTERPRISES
DATE PROCESSED: 07/16/2012
DATE SAMPLED: 04/13/2012
SAMPLE NUMBER: 20304
MATERIAL: Dairy
SAMPLE TYPE: JB PIT 2
STORAGE SYSTEM: LIQUID

ACCT: 797

RIO CREEK FEED MILL
N7295 FEED MILL LANE
ALGOMA, WI 54201

DRY MATTER, % 5.30

MOISTURE, % 94.70

	Estimated Available Nutrient Credits			
	Total Nutrients lbs/1000 gal	In 1st Year of Application lbs/1000 gal	If Applied 2 Consecutive Yrs lbs/1000 gal	If Applied 3 Consecutive Yrs lbs/1000 gal
Nitrogen (Injected)	24.90	9.96	12.45	13.70
Nitrogen(Surface Applied)	24.90	7.47	9.96	11.21
Phosphorus as P_2O_5	8.97	5.38	6.28	6.72
Potassium as K_2O	18.74	14.99	16.87	17.80
Sulfur	2.55	1.53	1.79	1.91
Estimated Value of Available Nutrients		$16.49	$19.70	$21.30

MINOR ELEMENTS *3

Calcium:	N/R	Zinc:	N/R
Magnesium:	N/R	Manganese:	N/R
Copper:	N/R	Sodium:	N/R
Iron:	N/R		

COMMENTS

*1 Applications of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.
Availability of N changes depending on application technique.
Injection or incorporation within 3 days of application results in higher N availability.

*2 Value based on commercial fertilizer costs as of 06/21/2011.
N (Urea)$0.61/lb, P2O5 (Triple Superphosphate)$0.75/lb, K2O (Potash)$0.48/lb,
S (Elemental Sulfur)$0.46/lb.

*3 If minor elements are requsted, they are reported on a 'dry matter' basis.
If ammonia, nitrate or pH are requested, they are reported on an 'as is' basis.

MANURE NUTRIENT ANALYSIS REPORT

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ANALYSIS FOR: EBERT ENTERPRISES
DATE PROCESSED: 07/16/2012
DATE SAMPLED: 04/14/2012
SAMPLE NUMBER: 20305
MATERIAL: Dairy
SAMPLE TYPE: JB PIT 2
STORAGE SYSTEM: LIQUID

ACCT: 797

RIO CREEK FEED MILL
N7295 FEED MILL LANE
ALGOMA, WI 54201

DRY MATTER, % 5.30

MOISTURE, % 94.70

	Estimated Available Nutrient Credits			
	Total Nutrients lbs/1000 gal	In 1st Year of Application lbs/1000 gal	If Applied 2 Consecutive Yrs lbs/1000 gal	If Applied 3 Consecutive Yrs lbs/1000 gal
Nitrogen (Injected)	24.90	9.96	12.45	13.70
Nitrogen(Surface Applied)	24.90	7.47	9.96	11.21
Phosphorus as P_2O_5	9.17	5.50	6.42	6.88
Potassium as K_2O	18.05	14.44	16.25	17.15
Sulfur	2.60	1.56	1.82	1.95
Estimated Value of Available Nutrients		$16.33	$19.52	$21.12

MINOR ELEMENTS *3

Calcium:	N/R	Zinc:	N/R
Magnesium:	N/R	Manganese:	N/R
Copper:	N/R	Sodium:	N/R
Iron:	N/R		

COMMENTS

*1 Applications of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.
Availability of N changes depending on application technique.
Injection or incorporation within 3 days of application results in higher N availability.

*2 Value based on commercial fertilizer costs as of 06/21/2011.
N (Urea)$0.61/lb, P2O5 (Triple Superphosphate)$0.75/lb, K2O (Potash)$0.48/lb,
S (Elemental Sulfur)$0.46/lb.

*3 If minor elements are requsted, they are reported on a 'dry matter' basis.
If ammonia, nitrate or pH are requested, they are reported on an 'as is' basis.

MANURE NUTRIENT ANALYSIS REPORT

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ANALYSIS FOR: EBERT ENTERPRISES
DATE PROCESSED: 07/16/2012
DATE SAMPLED: 04/24/2012
SAMPLE NUMBER: 20306
MATERIAL: Dairy
SAMPLE TYPE: PIT 2 DS-RK
STORAGE SYSTEM: LIQUID

ACCT: 797

RIO CREEK FEED MILL
N7295 FEED MILL LANE
ALGOMA, WI 54201

DRY MATTER, % 4.80

MOISTURE, % 95.20

	Estimated Available Nutrient Credits			
	Total Nutrients lbs/1000 gal	In 1st Year of Application lbs/1000 gal	If Applied 2 Consecutive Yrs lbs/1000 gal	If Applied 3 Consecutive Yrs lbs/1000 gal
Nitrogen (Injected)	21.58	8.63	10.79	11.87
Nitrogen(Surface Applied)	21.58	6.47	8.63	9.71
Phosphorus as P_2O_5	8.67	5.20	6.07	6.50
Potassium as K_2O	17.98	14.38	16.18	17.08
Sulfur	2.43	1.46	1.70	1.82
Estimated Value of Available Nutrients		$15.42	$18.36	$19.83

MINOR ELEMENTS *3

Calcium:	N/R	Zinc:	N/R
Magnesium:	N/R	Manganese:	N/R
Copper:	N/R	Sodium:	N/R
Iron:	N/R		

COMMENTS

*1 Applications of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.
Availability of N changes depending on application technique.
Injection or incorporation within 3 days of application results in higher N availability.

*2 Value based on commercial fertilizer costs as of 06/21/2011.
N (Urea)$0.61/lb, P2O5 (Triple Superphosphate)$0.75/lb, K2O (Potash)$0.48/lb,
S (Elemental Sulfur)$0.46/lb.

*3 If minor elements are requsted, they are reported on a 'dry matter' basis.
If ammonia, nitrate or pH are requested, they are reported on an 'as is' basis.

MANURE NUTRIENT ANALYSIS REPORT

AgSource
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BONDUEL, WI 54107
PHONE (715)758-2178 FAX (715)758-2620

ANALYSIS FOR: EBERT ENTERPRISES
DATE PROCESSED: 07/16/2012
DATE SAMPLED: 05/23/2012
SAMPLE NUMBER: 20307
MATERIAL: Dairy
SAMPLE TYPE: 3RD STAGE LAGOON
STORAGE SYSTEM: LIQUID

ACCT: 797

RIO CREEK FEED MILL
N7295 FEED MILL LANE
ALGOMA, WI 54201

DRY MATTER, % 4.50

MOISTURE, % 95.50

	Estimated Available Nutrient Credits			
	Total Nutrients lbs/1000 gal	In 1st Year of Application lbs/1000 gal	If Applied 2 Consecutive Yrs lbs/1000 gal	If Applied 3 Consecutive Yrs lbs/1000 gal
Nitrogen (Injected)	18.26	7.30	9.13	10.04
Nitrogen(Surface Applied)	18.26	5.48	7.30	8.22
Phosphorus as P_2O_5	7.87	4.72	5.51	5.90
Potassium as K_2O	17.39	13.91	15.65	16.52
Sulfur	2.17	1.30	1.52	1.62
Estimated Value of Available Nutrients		$14.16	$16.80	$18.12

MINOR ELEMENTS *3

Calcium:	N/R	Zinc:	N/R
Magnesium:	N/R	Manganese:	N/R
Copper:	N/R	Sodium:	N/R
Iron:	N/R		

COMMENTS

*1 Applications of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.
Availability of N changes depending on application technique.
Injection or incorporation within 3 days of application results in higher N availability.

*2 Value based on commercial fertilizer costs as of 06/21/2011.
N (Urea)$0.61/lb, P2O5 (Triple Superphosphate)$0.75/lb, K2O (Potash)$0.48/lb,
S (Elemental Sulfur)$0.46/lb.

*3 If minor elements are requsted, they are reported on a 'dry matter' basis.
If ammonia, nitrate or pH are requested, they are reported on an 'as is' basis.

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PHONE (715)758-2178 FAX (715)758-2620

ANALYSIS FOR: EBERT ENTERPRISES
DATE PROCESSED: 10/29/2012
DATE SAMPLED: 10/24/2012
SAMPLE NUMBER: 20998
MATERIAL: Dairy
SAMPLE TYPE: EBERT STAGE 2
STORAGE SYSTEM: LIQUID

ACCT: 797

RIO CREEK FEED MILL
N7295 FEED MILL LANE
ALGOMA, WI 54201

DRY MATTER, % 4.60

MOISTURE, % 95.40

	Estimated Available Nutrient Credits			
	Total Nutrients lbs/1000 gal	In 1st Year of Application lbs/1000 gal	If Applied 2 Consecutive Yrs lbs/1000 gal	If Applied 3 Consecutive Yrs lbs/1000 gal
Nitrogen (Injected)	24.90	9.96	12.45	13.70
Nitrogen(Surface Applied)	24.90	7.47	9.96	11.21
Phosphorus as P_2O_5	9.18	5.51	6.43	6.89
Potassium as K_2O	18.78	15.03	16.91	17.85
Sulfur	2.21	1.33	1.55	1.66
Estimated Value of Available Nutrients		$16.96	$20.40	$22.13

MINOR ELEMENTS *3

Calcium:	N/R	Zinc:	N/R
Magnesium:	N/R	Manganese:	N/R
Copper:	N/R	Sodium:	N/R
Iron:	N/R		

COMMENTS

*1 Applications of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.
Availability of N changes depending on application technique.
Injection or incorporation within 3 days of application results in higher N availability.

*2 Value based on commercial fertilizer costs as of 08/10/2012.
N (Urea)$0.74/lb, P2O5 (Triple Superphosphate)$0.71/lb, K2O (Potash)$0.48/lb,
S (Elemental Sulfur)$0.23/lb.

*3 If minor elements are requsted, they are reported on a 'dry matter' basis.
If ammonia, nitrate or pH are requested, they are reported on an 'as is' basis.

MANURE NUTRIENT ANALYSIS REPORT

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ANALYSIS FOR: EBERT ENTERPRISES
DATE PROCESSED: 10/29/2012
DATE SAMPLED: 10/25/2012
SAMPLE NUMBER: 20999
MATERIAL: Dairy
SAMPLE TYPE: EBERT STAGE 2
STORAGE SYSTEM: LIQUID

ACCT: 797

RIO CREEK FEED MILL
N7295 FEED MILL LANE
ALGOMA, WI 54201

DRY MATTER, % 4.60

MOISTURE, % 95.40

	Estimated Available Nutrient Credits			
	Total Nutrients lbs/1000 gal	In 1st Year of Application lbs/1000 gal	If Applied 2 Consecutive Yrs lbs/1000 gal	If Applied 3 Consecutive Yrs lbs/1000 gal
Nitrogen (Injected)	24.90	9.96	12.45	13.70
Nitrogen(Surface Applied)	24.90	7.47	9.96	11.21
Phosphorus as P_2O_5	9.18	5.51	6.43	6.89
Potassium as K_2O	18.60	14.88	16.74	17.67
Sulfur	2.21	1.33	1.55	1.66
Estimated Value of Available Nutrients		$16.89	$20.33	$22.04

MINOR ELEMENTS *3

Calcium:	N/R	Zinc:	N/R
Magnesium:	N/R	Manganese:	N/R
Copper:	N/R	Sodium:	N/R
Iron:	N/R		

COMMENTS

*1 Applications of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.
Availability of N changes depending on application technique.
Injection or incorporation within 3 days of application results in higher N availability.

*2 Value based on commercial fertilizer costs as of 08/10/2012.
N (Urea) $0.74/lb, P2O5 (Triple Superphosphate) $0.71/lb, K2O (Potash) $0.48/lb,
S (Elemental Sulfur) $0.23/lb.

*3 If minor elements are requsted, they are reported on a 'dry matter' basis.
If ammonia, nitrate or pH are requested, they are reported on an 'as is' basis.

MANURE NUTRIENT ANALYSIS REPORT

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PHONE (715)758-2178 FAX (715)758-2620

ANALYSIS FOR: EBERT ENTERPRISES
DATE PROCESSED: 03/11/2013
DATE SAMPLED: 11/05/2012
SAMPLE NUMBER: 22027
MATERIAL: Dairy
SAMPLE TYPE: PIT 3-1
STORAGE SYSTEM: LIQUID

ACCT: 797

RIO CREEK FEED MILL
N7295 FEED MILL LANE
ALGOMA, WI 54201

DRY MATTER, % 3.40

MOISTURE, % 96.60

	Estimated Available Nutrient Credits			
	Total Nutrients lbs/1000 gal	In 1st Year of Application lbs/1000 gal	If Applied 2 Consecutive Yrs lbs/1000 gal	If Applied 3 Consecutive Yrs lbs/1000 gal
Nitrogen (Injected)	14.94	5.98	7.47	8.22
Nitrogen(Surface Applied)	14.94	4.48	5.98	6.72
Phosphorus as P_2O_5	7.04	4.23	4.93	5.28
Potassium as K_2O	17.95	14.36	16.15	17.05
Sulfur	1.72	1.03	1.20	1.29
Estimated Value of Available Nutrients		$13.45	$15.95	$17.21

MINOR ELEMENTS *3

Calcium:	N/R	Zinc:	N/R
Magnesium:	N/R	Manganese:	N/R
Copper:	N/R	Sodium:	N/R
Iron:	N/R		

COMMENTS

*1 Applications of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.
Availability of N changes depending on application technique.
Injection or incorporation within 3 days of application results in higher N availability.

*2 Value based on commercial fertilizer costs as of 08/10/2012.
N (Urea)$0.74/lb, P2O5 (Triple Superphosphate)$0.71/lb, K2O (Potash)$0.48/lb,
S (Elemental Sulfur)$0.23/lb.

*3 If minor elements are requsted, they are reported on a 'dry matter' basis.
If ammonia, nitrate or pH are requested, they are reported on an 'as is' basis.

MANURE NUTRIENT ANALYSIS REPORT

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PHONE (715)758-2178 FAX (715)758-2620

ANALYSIS FOR: EBERT ENTERPRISES LLC
DATE PROCESSED: 03/11/2013
DATE SAMPLED: 11/05/2012
SAMPLE NUMBER: 22028
MATERIAL: Dairy
SAMPLE TYPE: PIT 3-2
STORAGE SYSTEM: LIQUID

ACCT: 797

RIO CREEK FEED MILL
N7295 FEED MILL LANE
ALGOMA, WI 54201

DRY MATTER, % 5.40

MOISTURE, % 94.60

	Estimated Available Nutrient Credits			
	Total Nutrients lbs/1000 gal	In 1st Year of Application lbs/1000 gal	If Applied 2 Consecutive Yrs lbs/1000 gal	If Applied 3 Consecutive Yrs lbs/1000 gal
Nitrogen (Injected)	22.41	8.96	11.21	12.33
Nitrogen(Surface Applied)	22.41	6.72	8.96	10.08
Phosphorus as P_2O_5	9.85	5.91	6.90	7.39
Potassium as K_2O	20.22	16.18	18.20	19.21
Sulfur	2.38	1.43	1.66	1.78
Estimated Value of Available Nutrients		$17.27	$20.65	$22.34

MINOR ELEMENTS *3

Calcium:	N/R	Zinc:	N/R
Magnesium:	N/R	Manganese:	N/R
Copper:	N/R	Sodium:	N/R
Iron:	N/R		

COMMENTS

*1 Applications of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.
Availability of N changes depending on application technique.
Injection or incorporation within 3 days of application results in higher N availability.

*2 Value based on commercial fertilizer costs as of 08/10/2012.
N (Urea) $0.74/lb, P2O5 (Triple Superphosphate) $0.71/lb, K2O (Potash) $0.48/lb,
S (Elemental Sulfur) $0.23/lb.

*3 If minor elements are requsted, they are reported on a 'dry matter' basis.
If ammonia, nitrate or pH are requested, they are reported on an 'as is' basis.

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ANALYSIS FOR: EBERT ENTERPRISES LLC
DATE PROCESSED: 03/11/2013
DATE SAMPLED: 11/06/2012
SAMPLE NUMBER: 22029
MATERIAL: Dairy
SAMPLE TYPE: PIT 3
STORAGE SYSTEM: LIQUID

ACCT: 797

RIO CREEK FEED MILL
N7295 FEED MILL LANE
ALGOMA, WI 54201

DRY MATTER, % 3.40

MOISTURE, % 96.60

	Estimated Available Nutrient Credits			
	Total Nutrients lbs/1000 gal	In 1st Year of Application lbs/1000 gal	If Applied 2 Consecutive Yrs lbs/1000 gal	If Applied 3 Consecutive Yrs lbs/1000 gal
Nitrogen (Injected)	16.60	6.64	8.30	9.13
Nitrogen(Surface Applied)	16.60	4.98	6.64	7.47
Phosphorus as P_2O_5	6.66	3.99	4.66	4.99
Potassium as K_2O	16.90	13.52	15.21	16.05
Sulfur	1.64	0.98	1.15	1.23
Estimated Value of Available Nutrients		$13.24	$15.79	$17.06

MINOR ELEMENTS *3

Calcium:	N/R	Zinc:	N/R
Magnesium:	N/R	Manganese:	N/R
Copper:	N/R	Sodium:	N/R
Iron:	N/R		

COMMENTS

*1 Applications of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.
Availability of N changes depending on application technique.
Injection or incorporation within 3 days of application results in higher N availability.

*2 Value based on commercial fertilizer costs as of 08/10/2012.
N (Urea) $0.74/lb, P2O5 (Triple Superphosphate) $0.71/lb, K2O (Potash) $0.48/lb,
S (Elemental Sulfur) $0.23/lb.

*3 If minor elements are requsted, they are reported on a 'dry matter' basis.
If ammonia, nitrate or pH are requested, they are reported on an 'as is' basis.

Manure Spreader Calibration

Bill Jokela, UVM Extension Soils Specialist

Getting the most value from the manure on your farm, as well as minimizing potential for water pollution, requires careful management of the manure resource. This means applying manure at the proper time, incorporating the manure as soon as possible, knowing the nutrient content of the manure, and applying manure at the rate needed to meet the crop nutrient needs on each field (in combination with fertilizer). The only way to know what rate of manure you are applying is to calibrate the spreader. Then you can adjust accordingly to apply the desired application rate, based on a nutrient analysis of the manure.

General Approach

An application rate -- whether it is manure, fertilizer, or herbicide -- is defined as the amount of material applied per unit area of land. For manure, it is usually expressed in tons per acre (solid or semi-solid) or gallons per acre (liquid, or slurry), as follows:

Application Rate = Amount Applied (tons, gallons)/Area covered (acres)

So, to calibrate a manure spreader, you need to have reliable estimates of both ***amount applied*** and ***area covered***. There are a number of different ways to estimate each parameter.

Method 1. Based on Single Spreader Load: Solid, Semi-solid, or Liquid

1. Estimate ***amount applied***, or spreader capacity, based on one of following:

a) Manufacturer's rated spreader capacity
For full liquid spreaders use rated capacity directly. Adjust to account for less than full capacity, for example, because of foaming or non-level surface. Actual load may typically be 90% of rated capacity. For box type solid or semi-solid spreader, adjust rated capacity according to fullness of load. Be sure to note if rated capacity is "heaped" or "struck (level) load". (Some equipment specifications include both.) If rating is "heaped" capacity, adjust according to Figure 1 for your typical spreader load. If there is any uncertainty about the rated capacity, a more accurate method is to measure actual volume, as in b) below.

b) Measured volume of spreader
Measure and calculate volume of spreader in cubic feet (Figure 2). Convert cubic feet to pounds, and then to tons or gallons, based on manure density. (See Manure Conversion box.)

c) Weigh spread load directly.
If you have access to scales, weigh spreader full, then subtract spreader weight empty to get weight of manure. Convert to tons or gallons.

Manure Conversions

1 ton = 2000 pounds
1 cubic foot = 7.5 gallons
1 bushel = 1.25 cubic feet
1 gallon = 8.3 pounds
1 cubic foot = 62 pounds (wet) to 55 pounds (dry)*

*Manure density (weight per cubic foot) varies with moisture content, primarily depending on amount of bedding.
For a more accurate estimate, weigh a five-gallon pail of manure, then multiply the weight by 1.5 to get the density in pounds per cubic foot

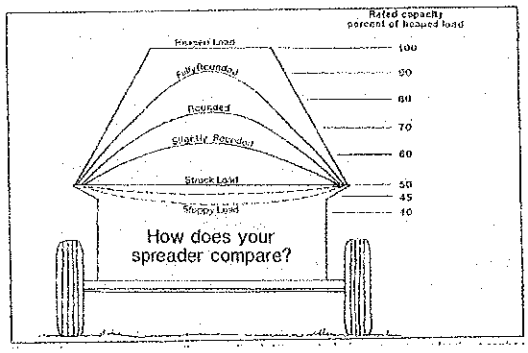

Fig. 1. Box spreader capacity with different types of loading (Way, 1983)

Table 1.2-17. Determining manure spreader capacity.

Spreader capacity, weight basis:

Tons per load = volume x density ÷ 2000

Density varies from 55 to 62 lb/cu ft depending on manure moisture:

dry manure is 55 and liquid manure is 62.

Spreader capacity, volume basis:

100 gal per load = volume ÷ 13.4

Calculate the volumes as follows (see diagrams at right):

Solid or semisolid manure

A. Box-shaped spreader[1] (level load)

Volume = length (l) x width (w) x depth (d)

B. Box-shaped spreader[1] (piled load)

Volume = length (l) x width (w) x [depth (d) + stacking height (h) x 0.8]

C. Flail-type barrel spreader (level load)

Volume = length (l) x depth (d) x depth (d) x 1.6

D. Flail-type barrel spreader (piled load)

Volume = length (l) x depth (d) x 1.6 x [depth (d) + stacking height (h)]

Liquid manure

Box-shaped spreader[1]—same as box-shaped spreader (level load)

Flail-type barrel spreader—same as flail-type spreader (level load)

E. Tank spreader (round)

Volume = length (l) x tank diameter (d) x tank diameter (d) x 0.8

F. Tank spreader (nonrounded)

Volume = length (l) x width (w) x depth (d) x 0.8

[1] For a box spreader with sloping sides, use an average width.

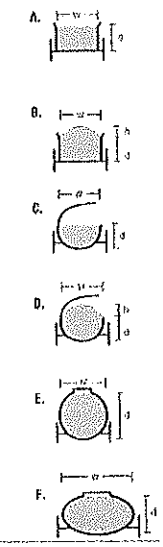

Fig. 2. Determining manure spreader capacity (Beegle, 2003)

2. Estimate ***area covered*** by one spreader load by doing the following:

   a) Measure width of one spreader pass, allowing for any overlap with adjacent passes.
   b) Measure distance traveled to empty spreader (adjusting for distance at beginning and end when spreading a partial rate) by one of the following:
      1) Use measuring wheel or long tape measure
      2) Measure number of tractor tire revolutions:
         (a) Tie cord around rear tire at top.
         (b) Measure distance traveled in exactly one revolution.
         (c) Count number of tire revolutions to empty spreader.
         (d) Distance = Number of revolutions x distance per revolution

c) Calculate area covered by one spreader load:

Spreader width (ft) x Distance (ft)/43,560 sq ft = Area (acres)

3. Calculate manure ***application rate*** by dividing ***amount applied*** by ***area covered***:

Method 2. Application Rate Based on Spreader Loads Applied to a Field: Solid, Semi-solid, or Liquid

1. Determine amount of manure per spreader load by a method in 1 above.
2. Count number of loads applied to field in a uniform application.
3. Determine accurate acreage of field.
4. Calculate manure application rate for field:

Application Rate = (No. loads x tons or gallons per load)/Field acreage

Method 3. Application Rate Based on Plastic Sheet Subsample: Solid or Semi-solid

This method involves measuring the amount of manure spread on a plastic sheet of known area (20 to 40 sq ft is a reasonable size). It is most useful where making an accurate estimate of spreader capacity is difficult, e.g. a heaped box spreader.

1. Cut three plastic sheets of similar size, e.g. 4 ft x 7 ft; 6 ft x 6 ft; 4 ft 8 in x 4 ft 8 in
2. Weigh large bucket (e.g. five gallon) and one plastic sheet on scale.
3. Lay sheets flat in the field some distance apart in the intended path of the manure spreader and hold down with stones or small stakes in the corners. Allow enough distance before the first sheet so that spreader is applying at full rate.
4. Drive tractor and spreader directly over plastic sheets at normal speed, being sure to begin spreading well ahead of first sheet.
5. Check manure-covered sheet to be sure wheel traffic did not shift position of plastic. If plastic has moved, remeasure area covered by plastic (and now manure).
6. Carefully fold manure-covered plastic and place in large bucket.
7. Weigh bucket, plastic, and manure and subtract weight of empty bucket and plastic to obtain weight of manure.
8. Repeat steps e-g for other plastic sheets.
9. Calculate manure application rate for each plastic sheet from Table 1 or use the following formula:

   Application Rate (tons/acre) = (lbs. of manure on sheet x 21.8)/size of sheet (in sq ft)
   Size of sheet (sq ft) = length (ft) x width (ft)
   Note: If the sheet size is 21.8 sq ft, e.g. 4 ft 8 in x 4 ft 8 in (56 inches square or about 4 ft x f ft 6 in), then weight in lbs equals application rate in tons/acre.

10. Average the calculated rates from at least three plastic sheets. If two or more values are similar but one is unusually high or low, average only the similar ones.

Table 1. Manure application rates based on weight of manure on plastic sheets of different sizes.

Weight of Manure	Size of Plastic Sheet		
	4' x 7'	6' x 6'	56" x 56"
lbs	Manure Rate, Tons/Acre		
8	6	5	8
10	8	6	10
12	9	7	12
14	11	8	14
16	12	10	16
18	14	11	18
20	16	12	20
22	17	13	22
24	19	15	24
26	20	16	26
28	22	17	28
30	23	18	30
32	25	19	32
34	26	21	34
36	28	22	36
38	30	23	38
40	31	24	40
42	33	25	42
44	34	27	44
46	36	28	46
48	37	29	48
50	39	30	50

Method 4. Average Application Rate Based on Storage Volume Applied to Fields

This is not a calibration method in the same way as the others described here, but it is a way of estimating the average rate of manure applied to fields after emptying your manure storage. You need to know the capacity of your manure storage or an estimate of the portion applied on a given acreage.

Application Rate = Manure storage emptied (tons or gallons)/Area covered (acres)
If you know storage capacity only in volume (cubic feet), convert to gallons or tons using the conversion factors given earlier.

Adjustment to Obtain Desired Rate

Whichever calibration method is used, you will probably need to adjust the application rate to obtain the rate, or different rates, desired. Do this by changing a combination of tractor speed and spreader control. Then recalibrate the spreader by the same method. When the desired application rate is obtained, record the tractor and spreader settings for future reference. You may need to establish two or more rates for different crop types or varying nutrient needs.

References

Beegle, D. 2003. Penn State Agronomy Guide. p. 39-41. Penn State University. http://agguide.agronomy.psu.edu/PDF03/part1_2_4.pdf

Klausner, S. 1995. Nutrient management: crop production and water quality. Cornell Univ., Ithaca, NY.

Way, W. 1983. Manure Primer. Br. 1339. Univ. of Vermont Extension. Burlington, VT.

Solid Manure Calibration

Tractor/Truck Speed **mph**

Tarp Size **(10 X 10)** **43560 sq. ft/acre**

Tarp Weight Loaded with Manure **lbs x 435.6 equals lbs/acre divided by 2000 = tons/acre**

Procedure is run manure spreader spreading over tarp at set speeds to determine spreading rate

Repeat process three times and average to determine spreading rate