



FARM BUSINESS SERVICES

Supporting your rural business

Ludwell Partners Ltd
East Ash Farm
Bradworthy
EX22 7SP

Nutrient Management Plan 2021

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Nutrient Management Plan

Ludwell Partners Ltd - East Ash Farm

Index

	Page
Summary Notes	3
Farming Rules for Water - The Rules	4
Farm Details	5
Crop Requirements	6
Applications 2021 - Organic Manures and Artificial Fertiliser	7
Nutrients Applied vs Recommended Application	8
Application Records 2022	10

Nutrient Management Plan

Ludwell Partners Ltd - East Ash Farm

Summary Notes

This Nutrient Management Plan has been prepared on behalf of Ludwell Partners Ltd.

Ludwell Partners Ltd run an intensive dairy farm consisting of 540 milking cows which are farmed over 150ha of productive grassland. In excess of 14,000 litres of slurry is produced on farm each year. Slurry is a valuable resource and can reduce the need for artificial fertiliser. However, due to large quantities of slurry being applied for a number of years, the soil indices for phosphate and potash are all at, or above target levels.

Fields which are at target indices for P and K require only maintenance dressings for phosphate and potash. Fields which have P and K indices above target level have no requirement for applications of phosphate or potash. The crop requirements for both silage ground and grazing ground is outlined on page five.

The actual nutrients applied per field in the form of 34.5% N Fertiliser and Cattle Slurry throughout the year are outlined on page six. The total applied is compared to the recommendations for each field. This provides a useful indication to show if nutrients are being over or under supplied.

Page six highlights there is currently an oversupply of N, P & K on both the silage ground which is cut and the land which is solely used for grazing.

By applying over the recommendations for N, P & K, the nutrients are unutilised. This is not only expensive but increasing the risk of the nutrients being lost to the environment.

The over supply of Nitrogen leads to increased losses through denitrification or ammonification.

The over supply of phosphate is at risk of leaching which is likely to cause Eutrophication, threatening the aquatic life in nearby watercourses.

Cattle slurry contains a high level of potash which explains the large oversupply of this nutrient to the crop. As the potassium ions are unutilised they become fixed to the clay particles within the soil and therefore provide little benefit to the crop.

Silage Ground - Over Supply of Nutrients			
N (kg/ha)	P ₂ O ₅ (kg/ha)	K ₂ O (kg/ha)	
29.7	56.8	125.0	

Grass Ground - Over supply of Nutrients			
N (kg/ha)	P ₂ O ₅ (kg/ha)	K ₂ O (kg/ha)	
65.1	91.2	190.0	

Recommendations - Silage Ground

It is recommended that going forward only two applications of slurry are applied to silage ground. This would bring the nutrients supplied in line with the crop requirements.

Recommendations - Grazing Ground

There is no requirement for slurry applications to grass that is to be grazed. By stopping slurry applications, the artificial fertiliser will meet the demand of nitrogen without further increasing levels of phosphate and potash in the soil.☒

These actions will significantly reduce the amount of slurry being applied to the crop. Therefore, it is recommended that slurry is exported off farm to prevent soil indices of P & K rising further.

Nutrient Management Plan

Ludwell Partners Ltd - East Ash Farm

Farming Rules for Water – Are you following the rules?

Rule 1

Application of organic manures and manufactured fertilisers to cultivated land must be planned in advance to meet soil and crop nutrient needs and not exceed these levels. Planning must take into account where there is a significant risk of pollution and the results of testing for Phosphorus, Potassium, Magnesium, pH and Nitrogen levels in the soil, which must be done at least every 5 years.

Rule 2

Organic manures must not be stored on land:

- a) within 10 metres of inland freshwaters or coastal waters
- b) where there is significant risk of pollution entering inland freshwaters or coastal waters
- c) within 50 metres of a spring, well or borehole

Rule 3

Organic manures or manufactured fertilisers must not be applied:

- a) if the soil is waterlogged, flooded, or snow covered
- b) if the soil has been frozen for more than 12 hours in the previous 24 hours
- c) if there is significant risk of causing pollution

Rule 4

Organic manures must not be applied:

- a) within 10 metres of any inland freshwaters or coastal waters, except, if precision equipment is used, within 6 metres of inland freshwaters or coastal waters
- b) within 50 metres of a spring, well or borehole

Rule 5

Manufactured fertiliser must not be applied within 2 metres of inland freshwaters or coastal waters

Rule 6

Reasonable precautions to prevent significant soil erosion and runoff from:

- a) the application of organic manure or manufactured fertiliser
- b) land management and cultivation practices (such as seedbeds, tramlines, rows, beds, stubbles (including harvested land with haulm), polytunnels and irrigation)
- c) poaching by livestock

Rule 7

Any land within 5 metres of inland freshwaters and coastal waters must be protected from significant soil erosion by preventing poaching by livestock

Rule 8

Livestock feeders must not be positioned:

- a) within 10 metres of any inland freshwaters or coastal waters
- b) within 50 metres of a spring, well or borehole
- c) where there is significant risk of pollution from poaching around the feeder entering any inland freshwaters or coastal waters

Nutrient Management Plan

Ludwell Partners Ltd - East Ash Farm

Farm Details

Rainfall	High - 920mm/year
NVZ Status	N/A
Fertiliser Spreader Model	
Date of last check	
Manure/Slurry Spreader Model	
Date of last check	

Nutrient Management Plan

Ludwell Partners Ltd - East Ash Farm

Crop Requirements

Silage Ground - Four Cuts

SNS Status Moderate

Average Yield (tn/ha) 10.53

	First App kg/ha	Second App kg/ha	Third App kg/ha	Total
Roccommended Application - N	100	75	75	250
Roccommended Application - P ₂ O ₅	40	25	15	80
Recommended Application - K ₂ O	60	60	40	160

Grazing Ground

SNS Status Moderate

Average Yield (tn/ha) 9-12

	March	April	May	June	July	August	Total
Roccommended Application - N	30	30	30	30	30	30	180
Roccommended Application - P ₂ O ₅	20	0	0	0	0	0	20
Recommended Application - K ₂ O	0	0	0	0	0	0	0

Nutrient Management Plan

Ludwell Partners Ltd - East Ash Farm

Applications 2021 - Organic Manures and Artificial Fertiliser

Organic Manures Use											
Date	Type	DM Content	Spreading Method	Rate tn/ha	kg N/t	Total N (kg/ha)	Available N (kg/ha)	Total P2O5 (kg/ha)	Available P2O5 (kg/ha)	Total K2O (kg/ha)	Available K2O (kg/ha)
Silage Ground											
March	Cattle Slurry	20%	Trailing Shoe	38.0	2.6	98.8	34.6	45.6	22.8	95.0	85.5
May	Cattle Slurry	20%	Trailing Shoe	38.0	2.6	98.8	34.6	45.6	22.8	95.0	85.5
June	Cattle Slurry	20%	Trailing Shoe	38.0	2.6	98.8	34.6	45.6	22.8	95.0	85.5
Total						296.4	103.7	136.8	68.4	285.0	256.5
Grazed Grass											
April	Cattle Slurry	20%	Trailing Shoe	38.0	2.6	98.8	34.6	45.6	22.8	95.0	85.5
June	Cattle Slurry	20%	Trailing Shoe	38.0	2.6	98.8	34.6	45.6	22.8	95.0	85.5
Total						197.6	69.2	91.2	45.6	190.0	171.0

Fertiliser Application			
Date	Type	Quantity (kg/ha)	Available N
March	34.5% N	170.0	58.7
May	34.5% N	170.0	58.7
June	34.5% N	170.0	58.7
Total			176.0

Nutrient Management Plan

Ludwell Partners Ltd - East Ash Farm

Nutrients Applied vs Recommended Application

Field Details			Crop Information	Soil Information	Total Nutrients Applied from Organic Manures and or Fertiliser (kg/ha)			Recommended Applications (kg/ha)			Over/Under Supply of Nutrients (kg/ha)		
Sheet ID	Parcel ID	Total area (ha)	Grazed or Cut	Soil Type	N	P	K	N	P	K	N	P	K
SS2920	9407	4.32	Cut - 4 times a year	Clay Loam	1208	591	1231	1080	346	691	128	245	540
SS3017	5423	7.49	Cut - 4 times a year	Clay Loam	2096	1025	2136	1873	599	1199	222	426	937
SS3116	5852	3.19	Cut - 4 times a year	Clay Loam	893	437	910	799	256	511	95	181	399
SS3214	1036	4.06	Cut - 4 times a year	Clay Loam	1136	556	1158	1016	325	650	121	231	508
SS3216	6964	8.86	Cut - 4 times a year	Clay Loam	2479	1212	2526	2216	709	1418	263	503	1108
SS3216	9668	2.77	Grazed	Clay Loam	679	253	527	499	0	0	180	253	527
SS3315	5194	6.58	Cut - 4 times a year	Clay Loam	1841	901	1876	1646	527	1053	195	374	823
SS3316	0758	1.51	Grazed	Clay Loam	370	138	287	272	0	0	98	138	287
SS3316	1098	3.21	Cut - 4 times a year	Clay Loam	897	439	914	802	257	513	95	182	401
SS3316	2081	3.96	Cut - 4 times a year	Clay Loam	1107	542	1128	990	317	633	118	225	495
SS3316	2432	2.35	Cut - 4 times a year	Clay Loam	657	321	670	587	188	376	70	133	294
SS3316	2666	0.61	Grazed	Clay Loam	149	56	116	110	0	0	40	56	116
SS3316	2848	6.38	Cut - 4 times a year	Clay Loam	1785	873	1819	1596	511	1021	190	363	798
SS3316	3396	5.02	Cut - 4 times a year	Clay Loam	1403	686	1430	1254	401	803	149	285	627
SS3316	3515	3.36	Cut - 4 times a year	Clay Loam	940	460	958	840	269	538	100	191	420
SS3316	3566	0.42	Grazed	Clay Loam	103	38	80	76	0	0	27	38	80
SS3316	4453	2.81	Cut - 4 times a year	Clay Loam	785	384	800	702	225	449	83	160	351
SS3316	4736	2.86	Cut - 4 times a year	Clay Loam	799	391	814	714	229	457	85	162	357
SS3316	4881	2.27	Grazed	Clay Loam	557	207	432	409	0	0	148	207	432
SS3316	5721	4.96	Cut - 4 times a year	Clay Loam	1387	678	1413	1240	397	794	147	282	620
SS3316	5976	2.29	Grazed	Clay Loam	561	209	435	412	0	0	149	209	435
SS3316	6153	6.21	Cut - 4 times a year	Clay Loam	1737	850	1770	1553	497	994	184	353	776
SS3316	7106	5.29	Cut - 4 times a year	Clay Loam	1481	724	1509	1323	423	847	157	301	662

Nutrient Management Plan

Ludwell Partners Ltd - East Ash Farm

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Field Details			Crop Information	Soil Information	Total Nutrients Applied from Organic Manures and or Fertiliser (kg/ha)			Recommended Applications (kg/ha)			Over/Under Supply of Nutrients (kg/ha)		
Sheet ID	Parcel ID	Total area (ha)	Grazed or Cut	Soil Type	N	P	K	N	P	K	N	P	K
SS3316	7296	3.45	Cut - 4 times a year	Clay Loam	965	472	984	863	276	552	102	196	431
SS3316	7573	3.47	Cut - 4 times a year	Clay Loam	971	475	989	868	278	555	103	197	434
SS3316	8323	2.72	Cut - 4 times a year	Clay Loam	761	372	776	680	218	435	81	155	340
SS3316	9506	4.12	Cut - 4 times a year	Clay Loam	1151	563	1173	1029	329	658	122	234	514
SS3317	2121	3.88	Cut - 4 times a year	Clay Loam	1084	530	1104	969	310	620	115	220	484
SS3317	5002	9.89	Cut - 4 times a year	Clay Loam	2765	1352	2818	2472	791	1582	294	562	1236
SS3317	6599	8.78	Cut - 4 times a year	Clay Loam	2457	1202	2503	2196	703	1405	261	499	1098
SS3317	8821	0.49	Cut - 4 times a year	Clay Loam	138	68	141	124	40	79	15	28	62
SS3317	8844	1.99	Cut - 4 times a year	Clay Loam	557	272	567	498	159	318	59	113	249
SS3317	8915	0.72	Cut - 4 times a year	Clay Loam	202	99	206	181	58	116	21	41	90
SS3317	8928	0.76	Cut - 4 times a year	Clay Loam	211	103	215	189	60	121	22	43	95
SS3416	7347	1.87	Cut - 4 times a year	Clay Loam	522	255	532	467	149	299	55	106	233
SS3416	8050	0.60	Cut - 4 times a year	Clay Loam	168	82	171	150	48	96	18	34	75
SS3514	6563	4.87	Cut - 4 times a year	Clay Loam	1362	666	1388	1218	390	779	145	277	609
SS3514	7479	1.69	Cut - 4 times a year	Clay Loam	472	231	481	422	135	270	50	96	211
SS3514	7970	1.35	Cut - 4 times a year	Clay Loam	376	184	383	336	108	215	40	76	168
SS3514	8262	1.87	Cut - 4 times a year	Clay Loam	522	255	532	467	149	299	55	106	233
SS3514	8482	0.99	Cut - 4 times a year	Clay Loam	276	135	281	246	79	158	29	56	123
SS3514	8952	2.24	Cut - 4 times a year	Clay Loam	625	306	637	559	179	358	66	127	280
SS3614	0658	2.19	Cut - 4 times a year	Clay Loam	612	299	623	547	175	350	65	124	273
SS3614	1541	2.51	Cut - 4 times a year	Clay Loam	703	344	716	628	201	402	75	143	314
SS3614	2162	0.69	Cut - 4 times a year	Clay Loam	193	94	197	172	55	110	20	39	86
SS3614	2554	1.31	Cut - 4 times a year	Clay Loam	367	180	374	328	105	210	39	75	164

Nutrient Management Plan

Ludwell Partners Ltd - East Ash Farm

Application Records 2022

Field Details			Crop Information	Soil Information	Slurry Applications - Cattle Slurry 20% DM					
Sheet ID	Parcel ID	Total area (ha)	Grazed or Cut	Soil Type	1st Application		2nd Application		3rd Application	
					Date	Quantity Applied	Date	Quantity Applied	Date	Quantity Applied
SS2920	9407	4.319		Clay Loam						
SS3017	5423	7.493		Clay Loam						
SS3116	5852	3.1941		Clay Loam						
SS3214	1036	4.0624		Clay Loam						
SS3216	6964	8.8633		Clay Loam						
SS3216	9668	2.7717		Clay Loam						
SS3315	5194	6.5836		Clay Loam						
SS3316	0758	1.5107		Clay Loam						
SS3316	1098	3.2077		Clay Loam						
SS3316	2081	3.9591		Clay Loam						
SS3316	2432	2.3494		Clay Loam						
SS3316	2666	0.6086		Clay Loam						
SS3316	2848	6.3834		Clay Loam						
SS3316	3396	5.0177		Clay Loam						
SS3316	3515	3.3612		Clay Loam						
SS3316	3566	0.4209		Clay Loam						
SS3316	4453	2.8081		Clay Loam						
SS3316	4736	2.8574		Clay Loam						
SS3316	4881	2.2742		Clay Loam						
SS3316	5721	4.9594		Clay Loam						
SS3316	5976	2.2893		Clay Loam						
SS3316	6153	6.2114		Clay Loam						
SS3316	7106	5.2934		Clay Loam						

Nutrient Management Plan

Ludwell Partners Ltd - East Ash Farm

Application Records 2022

Field Details			Crop Information	Soil Information	Slurry Applications - Cattle Slurry 20% DM					
Sheet ID	Parcel ID	Total area (ha)	Grazed or Cut	Soil Type	1st Application		2nd Application		3rd Application	
					Date	Quantity Applied	Date	Quantity Applied	Date	Quantity Applied
SS3316	7296	3.4511		Clay Loam						
SS3316	7573	3.4705		Clay Loam						
SS3316	8323	2.7211		Clay Loam						
SS3316	9506	4.115		Clay Loam						
SS3317	2121	3.8753		Clay Loam						
SS3317	5002	9.886		Clay Loam						
SS3317	6599	8.7833		Clay Loam						
SS3317	8821	0.4947		Clay Loam						
SS3317	8844	1.9901		Clay Loam						
SS3317	8915	0.7233		Clay Loam						
SS3317	8928	0.756		Clay Loam						
SS3416	7347	1.8666		Clay Loam						
SS3416	8050	0.6		Clay Loam						
SS3514	6563	4.8705		Clay Loam						
SS3514	7479	1.688		Clay Loam						
SS3514	7970	1.3451		Clay Loam						
SS3514	8262	1.8663		Clay Loam						
SS3514	8482	0.9859		Clay Loam						
SS3514	8952	2.2363		Clay Loam						
SS3614	0658	2.1873		Clay Loam						
SS3614	1541	2.5128		Clay Loam						
SS3614	2162	0.6897		Clay Loam						
SS3614	2554	1.313		Clay Loam						

Nutrient Management Plan

Ludwell Partners Ltd - East Ash Farm

Application Records 2022

Field Details			Fertiliser Application - 34.5% N					
Sheet ID	Parcel ID	Total area (ha)	1st Application		2nd Application		3rd Application	
			Date	Quantity Applied	Date	Quantity Applied	Date	Quantity Applied
SS2920	9407	4.319						
SS3017	5423	7.493						
SS3116	5852	3.1941						
SS3214	1036	4.0624						
SS3216	6964	8.8633						
SS3216	9668	2.7717						
SS3315	5194	6.5836						
SS3316	0758	1.5107						
SS3316	1098	3.2077						
SS3316	2081	3.9591						
SS3316	2432	2.3494						
SS3316	2666	0.6086						
SS3316	2848	6.3834						
SS3316	3396	5.0177						
SS3316	3515	3.3612						
SS3316	3566	0.4209						
SS3316	4453	2.8081						
SS3316	4736	2.8574						
SS3316	4881	2.2742						
SS3316	5721	4.9594						
SS3316	5976	2.2893						
SS3316	6153	6.2114						
SS3316	7106	5.2934						

Nutrient Management Plan

Ludwell Partners Ltd - East Ash Farm

Application Records 2022

Field Details			Fertiliser Application - 34.5% N					
Sheet ID	Parcel ID	Total area (ha)	1st Application		2nd Application		3rd Application	
			Date	Quantity Applied	Date	Quantity Applied	Date	Quantity Applied
SS3316	7296	3.4511						
SS3316	7573	3.4705						
SS3316	8323	2.7211						
SS3316	9506	4.115						
SS3317	2121	3.8753						
SS3317	5002	9.886						
SS3317	6599	8.7833						
SS3317	8821	0.4947						
SS3317	8844	1.9901						
SS3317	8915	0.7233						
SS3317	8928	0.756						
SS3416	7347	1.8666						
SS3416	8050	0.6						
SS3514	6563	4.8705						
SS3514	7479	1.688						
SS3514	7970	1.3451						
SS3514	8262	1.8663						
SS3514	8482	0.9859						
SS3514	8952	2.2363						
SS3614	0658	2.1873						
SS3614	1541	2.5128						
SS3614	2162	0.6897						
SS3614	2554	1.313						