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Yields of the Field Experiments 1975

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75/ R&w/CS/10 - Long Term Liming - Oats

Rothamsted Research

Rothamsted Research (1976) 75/ R&w/CS/10 - Long Term Liming - Oats ; Yields Of The Field Experiments 1975, pp 136 - 147 - DOI: <https://doi.org/10.23637/ERADOC-1-141>

75/R/CS/10 and 75/W/CS/10

LONG TERM LIMING

Object: To study the effects of different amounts of lime on the yields of a range of crops. The direct effects of P and K and the residual effects of Mg are also studied - Rothamsted (R) Sawyers I and Woburn (W) Stackyard C.

Sponsor: J. Bolton.

The 14th year, oats.

For previous years see 'Details' 1967, 68/C/3(t), 69/R&W/CS/10, 70/R&W/CS/10(t) and 71-74/R&W/CS/10.

Design: 2 randomised blocks of 16 plots, split into 2.

Whole plot dimensions: 6.40 x 18.3.

Treatments: All combinations of:-

Whole plots: 1. Ground chalk (tonnes CaCO_3) (total applied 1962-63): LIME

Rothamsted (R)	Woburn (W)	R	W
None	None	0	0
5	5	5	5
10	12	10	12
20	19	20	19

2. Phosphate, applied cumulatively to previous dressings, as superphosphate (kg P_{205}): P_{205}

None	0
63	63

3. Potassium, applied cumulatively to previous dressings, as muriate of potash (kg K_{20}): K_{20}

None	0
126	126

Sub plots: 4. Magnesium, applied 1974 only, as Epsom salts (kg Mg): $\text{MG}(74)$

None	0
112	112

75/R/CS/10 and 75/W/CS/10

Basal applications:

Sawyers I (R): Manures: 80 kg N as 'Nitro-Chalk' combine drilled.
Weedkiller: Dicamba with mecoprop and MCPA ('Panlene Plus' at 5.6 l in 220 l).
Stackyard C (W): Manures: 80 kg N as 'Nitro-Chalk' combine drilled.
Weedkiller: Ioxynil at 0.52 kg with mecoprop at 1.6 kg in 280 l.

Seed: Sawyers I (R) and Stackyard C (W):

Oats: Manod, sown at 200 kg.

Cultivations, etc.:-

Sawyers I (R): Chisel ploughed: 7 Feb, 1975. Treatment P and K applied: 11 Mar. Rotary cultivated, seed sown, N applied: 25 Mar. Weedkiller applied: 19 May. Combine harvested: 18 Aug.
Stackyard C (W): Ploughed: 11 Dec, 1974. Treatment P and K applied: 17 Mar. Spring-tine cultivated, seed sown, N applied: 20 Mar. Weedkiller applied: 22 May. Combine harvested: 18 Aug.

NOTE: Photographs were taken and growth scores made in May.

75/R/CS/10 SAWYERS I(R)

GRAIN TONNES/HECTARE

*** TABLES OF MEANS ***

P2O5	0	63	MEAN
LIME			
0	1.50	2.21	1.85
5	2.15	2.69	2.42
10	2.61	3.12	2.86
20	2.50	3.09	2.80
MEAN	2.19	2.78	2.48

K2O	0	126	MEAN
LIME			
0	2.08	1.63	1.85
5	2.36	2.48	2.42
10	2.79	2.94	2.86
20	2.75	2.84	2.80
MEAN	2.49	2.47	2.48

K2O	0	126	MEAN
P2O5			
0	2.25	2.13	2.19
63	2.74	2.81	2.78
MEAN	2.49	2.47	2.48

MG	0	112	MEAN
LIME			
0	1.26	2.45	1.85
5	2.23	2.60	2.42
10	2.79	2.94	2.86
20	2.83	2.77	2.80
MEAN	2.28	2.69	2.48

MG	0	112	MEAN
P2O5			
0	2.02	2.36	2.19
63	2.54	3.02	2.78
MEAN	2.28	2.69	2.48

MG	0	112	MEAN
K2O			
0	2.37	2.62	2.49
126	2.19	2.76	2.47
MEAN	2.28	2.69	2.48

75/R/CS/10 SAWYERS 1(R)

GRAIN TONNES/HECTARE

*** TABLES OF MEANS ***

P205	0		63	
K20	0	126	0	126
LIME				
0	1.86	1.14	2.29	2.13
5	2.26	2.03	2.45	2.92
10	2.48	2.74	3.09	3.15
20	2.38	2.62	3.13	3.06

P205	0		63	
MG	0	112	0	112
LIME				
0	0.88	2.12	1.65	2.77
5	2.02	2.27	2.44	2.93
10	2.57	2.65	3.02	3.22
20	2.61	2.39	3.05	3.14

K20	0		126	
MG	0	112	0	112
LIME				
0	1.64	2.51	0.88	2.38
5	2.26	2.45	2.21	2.75
10	2.77	2.81	2.82	3.07
20	2.79	2.71	2.86	2.82

K20	0		126	
MG	0	112	0	112
P205				
0	2.10	2.39	1.94	2.33
63	2.63	2.85	2.45	3.18

	K20	0		126	
	MG	0	112	0	112
LIME	P205				
0	0	1.24	2.49	0.51	1.76
	63	2.04	2.54	1.25	3.00
5	0	2.26	2.26	1.73	2.29
	63	2.26	2.65	2.63	3.22
10	0	2.50	2.47	2.64	2.83
	63	3.04	3.14	2.99	3.30
20	0	2.41	2.35	2.81	2.44
	63	3.18	3.08	2.92	3.21

75/R/CS/10 SAWYERS I(R)

GRAIN TONNES/HECTARE

*** TABLES OF MEANS ***

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	LIME	P205	K20	MG
SED	0.203	0.144	0.144	0.061
TABLE	LIME P205	LIME K20	P205 K20	LIME MG
SED	0.287	0.287	0.203	0.221
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: LIME				0.123
TABLE	P205 MG	K20 MG	LIME P205 K20	LIME P205 MG
SED	0.156	0.156	0.406	0.312
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: P205	0.087			
K20		0.087		
LIME.P205				0.174
TABLE	LIME K20 MG	P205 K20 MG	LIME P205 K20 MG	
SED	0.312	0.221	0.442	
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: LIME.K20	0.174			
P205.K20		0.123		
LIME.P205.K20			0.245	

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	15	0.406	16.4
BLOCK.WP.SP	16	0.245	9.9

GRAIN MEAN DM% 87.0

75/R/CS/10 SAWYERS I(R)

STRAW TONNES/HECTARE

*** TABLES OF MEANS ***

P2O5	0	63	MEAN
LIME			
0	1.72	2.55	2.13
5	2.03	2.70	2.37
10	2.38	3.25	2.82
20	2.36	3.14	2.75
MEAN	2.12	2.91	2.52

K2O	0	126	MEAN
LIME			
0	2.21	2.05	2.13
5	1.99	2.74	2.37
10	2.53	3.10	2.82
20	2.52	2.98	2.75
MEAN	2.31	2.72	2.52

K2O	0	126	MEAN
P2O5			
0	2.07	2.17	2.12
63	2.56	3.27	2.91
MEAN	2.31	2.72	2.52

MG	0	112	MEAN
LIME			
0	1.72	2.55	2.13
5	2.30	2.43	2.37
10	2.85	2.79	2.82
20	2.83	2.68	2.75
MEAN	2.42	2.61	2.52

MG	0	112	MEAN
P2O5			
0	2.02	2.22	2.12
63	2.83	3.00	2.91
MEAN	2.42	2.61	2.52

MG	0	112	MEAN
K2O			
0	2.26	2.37	2.31
126	2.59	2.85	2.72
MEAN	2.42	2.61	2.52

75/R/CS/10 SAWYERS 1(R)

STRAW TONNES/HECTARE

*** TABLES OF MEANS ***

P205	0		63	
K20	0	126	0	126
LIME				
0	2.06	1.38	2.37	2.73
5	1.93	2.12	2.05	3.36
10	2.17	2.59	2.90	3.60
20	2.13	2.59	2.91	3.37

P205	0		63	
MG	0	112	0	112
LIME				
0	1.24	2.20	2.20	2.90
5	2.05	2.01	2.56	2.85
10	2.30	2.46	3.39	3.11
20	2.51	2.22	3.15	3.13

K20	0		126	
MG	0	112	0	112
LIME				
0	1.95	2.48	1.49	2.62
5	1.91	2.07	2.69	2.79
10	2.54	2.52	3.15	3.05
20	2.63	2.42	3.03	2.94

K20	0		126	
MG	0	112	0	112
P205				
0	1.92	2.23	2.12	2.22
63	2.60	2.52	3.05	3.48

	K20	0		126	
	MG	0	112	0	112
LIME	P205				
0	0	1.62	2.49	0.85	1.91
	63	2.28	2.47	2.13	3.33
5	0	1.91	1.96	2.18	2.07
	63	1.92	2.17	3.20	3.52
10	0	1.98	2.35	2.61	2.57
	63	3.10	2.69	3.68	3.52
20	0	2.16	2.10	2.85	2.34
	63	3.09	2.73	3.21	3.53

STRAW MEAN DM% 86.6

SUB PLOT AREA HARVESTED 0.00247

75/W/CS/10 STACKYARD C(W)

GRAIN TONNES/HECTARE

*** TABLES OF MEANS ***

P205	0	63	MEAN
LIME			
0	1.35	1.66	1.51
5	2.04	2.09	2.07
12	2.04	2.19	2.11
19	2.17	2.18	2.17
MEAN	1.90	2.03	1.97

K20	0	126	MEAN
LIME			
0	1.59	1.42	1.51
5	2.01	2.13	2.07
12	2.19	2.04	2.11
19	2.14	2.21	2.17
MEAN	1.98	1.95	1.97

K20	0	126	MEAN
P205			
0	1.95	1.85	1.90
63	2.01	2.05	2.03
MEAN	1.98	1.95	1.97

MG	0	112	MEAN
LIME			
0	0.89	2.12	1.51
5	1.84	2.30	2.07
12	1.96	2.27	2.11
19	1.98	2.37	2.17
MEAN	1.67	2.27	1.97

MG	0	112	MEAN
P205			
0	1.59	2.21	1.90
63	1.74	2.32	2.03
MEAN	1.67	2.27	1.97

MG	0	112	MEAN
K20			
0	1.80	2.16	1.98
126	1.53	2.37	1.95
MEAN	1.67	2.27	1.97

75/W/CS/10 STACKYARD C(W)

GRAIN TONNES/HECTARE

*** TABLES OF MEANS ***

P205	0		63	
K20	0	126	0	126
LIME				
0	1.45	1.25	1.74	1.59
5	2.07	2.01	1.94	2.25
12	2.19	1.89	2.18	2.19
19	2.09	2.24	2.19	2.17

P205	0		63	
MG	0	112	0	112
LIME				
0	0.71	1.99	1.07	2.25
5	1.82	2.26	1.85	2.34
12	1.39	2.19	2.03	2.35
19	1.94	2.39	2.01	2.35

K20	0		126	
MG	0	112	0	112
LIME				
0	1.09	2.10	0.70	2.14
5	1.95	2.07	1.72	2.54
12	2.13	2.25	1.79	2.29
19	2.05	2.23	1.90	2.51

K20	0		126	
MG	0	112	0	112
P205				
0	1.76	2.14	1.42	2.28
63	1.84	2.19	1.64	2.46

	K20	0		126	
	MG	0	112	0	112
LIME	P205				
0	0	0.93	1.97	0.48	2.01
	63	1.24	2.23	0.91	2.27
5	0	1.98	2.16	1.67	2.36
	63	1.91	1.97	1.78	2.71
12	0	2.14	2.25	1.65	2.13
	63	2.12	2.25	1.94	2.44
19	0	2.01	2.18	1.87	2.61
	63	2.09	2.29	1.93	2.41

75/W/CS/10 STACKYARD C(W)

GRAIN TONNES/HECTARE

*** TABLES OF MEANS ***

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	LIME	P205	K20	MG
SED	0.091	0.064	0.064	0.044

TABLE	LIME P205	LIME K20	P205 K20	LIME MG
SED	0.128	0.128	0.091	0.110
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: LIME				0.088

TABLE	P205 MG	K20 MG	LIME P205 K20	LIME P205 MG
SED	0.078	0.078	0.181	0.155
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: P205	0.062			
K20		0.062		
LIME.P205				0.124

TABLE	LIME K20 MG	P205 K20 MG	LIME P205 K20 MG
SED	0.155	0.110	0.220
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: LIME.K20	0.124		
P205.K20		0.088	
LIME.P205.K20			0.175

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	15	0.181	9.2
BLOCK.WP.SP	16	0.175	8.9

GRAIN MEAN DM% 84.8

75/W/CS/10 STACKYARD C(W)

STRAW TONNES/HECTARE

*** TABLES OF MEANS ***

P205	0	63	MEAN
LIME			
0	1.44	2.00	1.72
5	1.94	2.34	2.14
12	2.15	2.49	2.32
19	2.30	2.46	2.38
MEAN	1.96	2.32	2.14

K20	0	126	MEAN
LIME			
0	1.65	1.79	1.72
5	1.90	2.38	2.14
12	2.05	2.60	2.32
19	2.15	2.61	2.38
MEAN	1.94	2.34	2.14

K20	0	126	MEAN
P205			
0	1.81	2.11	1.96
63	2.06	2.58	2.32
MEAN	1.94	2.34	2.14

MG	0	112	MEAN
LIME			
0	1.21	2.23	1.72
5	1.95	2.34	2.14
12	2.28	2.36	2.32
19	2.26	2.50	2.38
MEAN	1.92	2.36	2.14

MG	0	112	MEAN
P205			
0	1.76	2.16	1.96
63	2.09	2.55	2.32
MEAN	1.92	2.36	2.14

MG	0	112	MEAN
K20			
0	1.79	2.08	1.94
126	2.06	2.63	2.34
MEAN	1.92	2.36	2.14

75/W/CS/10 STACKYARD C(W)

STRAW TONNES/HECTARE

*** TABLES OF MEANS ***

P205	0		63	
K20	0	126	0	126
LIME				
0	1.48	1.41	1.82	2.18
5	1.81	2.07	2.00	2.63
12	1.95	2.36	2.14	2.84
19	2.00	2.61	2.30	2.61

P205	0		63	
MG	0	112	0	112
LIME				
0	0.97	1.92	1.45	2.54
5	1.77	2.11	2.12	2.56
12	2.08	2.23	2.48	2.50
19	2.22	2.39	2.31	2.60

K20	0		126	
MG	0	112	0	112
LIME				
0	1.24	2.06	1.17	2.41
5	1.76	2.05	2.13	2.62
12	2.10	2.00	2.46	2.73
19	2.06	2.23	2.46	2.76

K20	0		126	
MG	0	112	0	112
P205				
0	1.70	1.92	1.82	2.41
63	1.88	2.25	2.30	2.86

	K20	0		126	
	MG	0	112	0	112
LIME	P205				
0	0	1.18	1.78	0.75	2.06
	63	1.30	2.33	1.59	2.76
5	0	1.67	1.95	1.87	2.27
	63	1.85	2.15	2.39	2.98
12	0	2.01	1.90	2.16	2.55
	63	2.19	2.09	2.77	2.91
19	0	1.95	2.05	2.48	2.74
	63	2.17	2.42	2.44	2.73

STRAW MEAN DM% 80.7

SUB PLOT ARE HARVESTED 0.00247