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Yields of the Field Experiments 2007

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Results of the
Classical and other
Long-term Experiments
2007

R/EX/4 Exhaustion Land

Rothamsted Research

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07/R/EX/4

EXHAUSTION LAND

Object: To study the residual effects of manures applied 1856 -1901, and of additional phosphate applied since 1986, on the yield of continuous s. barley up to 1991, w. wheat since – Hoosfield.

The 152nd year, w. wheat.

For previous years see 'Details' 1977, 1973 and Yield Books for 74-06/R/EX/4

Treatments: All combinations of:-

Whole plots (P test)

1. **OLD RES** Residues of manures applied annually 1876 – 1901:
 - O None
 - D Farmyard manure at 35 t
 - N 96 kg N as ammonium salts
 - P 34 kg P as superphosphate
 - NPKNAMG N and P as above plus 137 kg K as sulphate of potash, 16 kg Na as sulphate of soda, 11 kg Mg as sulphate of magnesia

2. **P** Maintenance P (20 kg P) applied annually from 2000 to maintain existing levels of available P In the soil. (P1) (P2) and (P3) are residues of P applied annually 1986–1992:

	2000-07	1986-92
O	None	None
P (P1)	20 kg P	44 kg P
P (P2)	20 kg P	87 kg P
P (P3)	20 kg P	131 kg P

NOTE: P treatments were applied at 61.5 kg P in error in 2000.

plus

Whole plots (K test, previously N test until 1991)

1. **OLD RES** Residues of manures applied annually 1876 – 1901:
 - O None
 - D Farmyard manure at 35 t
 - N* 96 kg N as nitrate of soda
 - PK 34 kg P as superphosphate, 137 kg K as sulphate of potash
 - N*PK N, P and K as above

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2. K	Potassium applied annually for 2007 as muriate of potash
O	None
K1	75 kg K ₂ O (62.2 kg K)
K2	150 kg K ₂ O (124.5 kg K)

Whole plots

Nitrogen: 50 kg N as ammonium sulphate (to supply sufficient S) during first two weeks in March, 200 kg N as ammonium nitrate at GS31/mid-April (whichever comes first) and 50 kg N as ammonium nitrate at GS37 (not later than mid-May)

Experimental diary:

K test:

		Rate	Unit
12-Oct-06	f Muriate of Potash - 023, 043, 063, 083, 103	125.00	kg/ha
	f Muriate of Potash – 024, 044, 064, 084, 104	250.00	kg/ha
	f Basal P (triplesuperphosphate) – plots 02, 04, 06, 08, 10	98.00	kg/ha

P test:

		Rate	Unit
12-Oct-06	f Triplesuperphosphate – plots 011–013, 031–033, 051–053, 071–073, 091–093	98.00	kg/ha
	f Basal K (muriate of potash) – plots 01, 03, 05, 07, 09	250.00	kg/ha

All Plots

		Rate	Unit
13-Oct-06	p Barclay Gallup 360	4.00	l/200 l/ha
19-Oct-06	a Plough/ N		
30-Oct-06	a Combination Drilled		
	s Xi19 tr Redigo Sib Secure	350.00	seeds/m ²
03-Nov-07	p Ice	4.00	l/200 l/ha
08-Dec-07	p Entice	7.00	kg/ha
12-Mar-07	f Sulphate of Ammonia	238.00	kg/ha
11-Apr-07	p Pacifica	0.50	kg/200 l/ha
	p Biopower	1.00	l/200 l/ha
23-Apr-07	p Clean Crop Wanderer	1.00	l/200 l/ha
	p Deuce	1.00	l/200 l/ha
26-Apr-07	f Nitraprill	580.00	kg/ha
22-May-07	p Amistar Opti	1.25	l/200 l/ha
	p Opus	0.80	l/200 l/ha
06-Jun-07	a Mow/Rotavate paths		
14-Jun-07	a Mow/Rotavate paths		
25-Jun-07	a Mow/Rotavate paths		
07-Aug-07	a Mow/Rotavate paths		
27-Aug-07	a Combine harvest O&E's		
	a Chop straw O&E's		
03-Sep-07	a Combine harvest, plots for yield		
	a Swath straw		
04-Sep-07	a Sample, bale and weigh straw		

Note: Samples of grain and straw were taken for chemical analysis.

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P TEST

GRAIN TONNES/HECTARE

***** Tables of means *****

P_RES	O	P1	P2	P3	Mean
OLD_RES					
O	1.93	4.22	5.25	5.38	4.20
D	2.85	4.66	5.27	5.53	4.58
N	1.81	3.95	4.78	4.65	3.80
P	3.28	4.77	5.71	5.10	4.72
NPKNAMG	2.09	3.67	5.03	5.13	3.98
Mean	2.39	4.26	5.21	5.16	4.26

GRAIN MEAN DM% 84.1

STRAW TONNES/HECTARES

***** Tables of means *****

P_RES	O	P1	P2	P3	Mean
OLD_RES					
O	0.38	0.99	1.64	1.51	1.13
D	0.75	1.29	1.58	1.42	1.26
N	0.82	1.64	1.98	1.93	1.59
P	1.07	1.16	1.63	1.75	1.40
NPKNAMG	0.61	1.04	1.58	1.78	1.25
Mean	0.73	1.22	1.68	1.68	1.33

STRAW MEAN DM% 90.4

PLOT AREA HARVESTED 0.00525

07/R/EX/4

K TEST

GRAIN TONNES/HECTARE

****Tables of means ****

K Test				
OLD_RES	K0	K1	K2	Mean
O	4.10	4.74	5.19	4.53
D	4.37	4.85	5.18	4.70
N*	4.49	4.58	4.56	4.53
PK	5.10	4.51	4.87	4.89
N*PK	4.09	3.62	4.46	4.06
Mean	4.43	4.46	4.85	4.54
rep.	10	5	5	

GRAIN MEAN DM% 84.0

STRAW TONNES/HECTARE

**** Tables of means ****

K Test				
OLD_RES	K0	K1	K2	Mean
O	1.49	1.58	1.41	1.49
D	0.90	1.35	1.46	1.15
N*	1.57	1.59	1.66	1.60
PK	1.35	1.06	1.30	1.26
N*PK	0.87	0.81	1.14	0.92
Mean	1.24	1.28	1.39	1.29
rep.	10	5	5	

STRAW MEAN DM% 89.0

PLOT AREA HARVESTED 0.00525