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Yields of the Field Experiments 2003

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Results of the
Classical
and other
Long-term Experiments
2003

Rothamsted Research

03/R/EX/4 - Exhaustion Land

Rothamsted Research

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03/R/EX/4

EXHAUSTION LAND

Object: To study the residual effects of manures applied 1876-1901, and of additional phosphate applied since 1986, on the yield of continuous s. barley up to 1991, w. wheat since - Hoosfield.

The 148th year, w. wheat.

For previous years see 'Details' 1977, 1973 and 74-02/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:
- | | 2000-03 | 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)

- 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 |

Experimental diary:

K test:

01-Oct-02 : T : P : P basal:(triple superphosphate at 98 kg), plots 2, 4, 6, 8 & 10.

P test:

01-Oct-02 : T : K : K basal/100 kg (muriate of potash at 250 kg), plots 1, 3, 5, 7 & 9.
: T : P : P test:(triple superphosphate at 98 kg), plots 011-013, 031-033, 051-053, 071-073, & 091-093.

All plots

05-Sep-02 : B : : Flat-lifted
: B : : Rolled.
01-Oct-02 : B : : Kieserite at 200 kg.
03-Oct-02 : B : : Chalk at 4 t.
: B : : Ploughed 25 cm wide furrows.
05-Oct-02 : B : : Rolled.
07-Oct-02 : B : : Combination drilled, Hereward, tr. Sibutol at 400 seeds/m².
08-Oct-02 : B : : Rolled.

03/R/EX/4

Experimental diary:

All plots

17-Feb-03 : B : : tm)Lexus 50 DF at 20 g in 200 l.
 : B : : tm)Stomp 400 SC at 3.0 l in 200 l.
 10-Mar-03 : B : : Sulphur Gold (30% N, 7.6% S) at 167 kg
 29-Apr-03 : B : : 33.5% N at 448 kg.
 07-May-03 : B : : tm)Ally at 30 g in 200 l.
 : B : : tm)Starane 2 at 0.75 l in 200 l.
 10-May-03 : B : : tm)Opus at 0.5 l in 200 l.
 : B : : tm)Amistar at 0.6 l in 200 l.
 28-May-03 : B : : tm)Opus at 0.5 l in 200 l.
 : B : : tm)Twist at 1.0 l in 200 l.
 26-Jul-03 : B : : Touchdown at 4.0 l in 200 l.
 06-Aug-03 : B : : Combine harvested, plots for yield.
 07-Aug-03 : B : : Combine harvested discards, Sampled, baled and weighed straw.

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

P TEST

GRAIN TONNES/HECTARE

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

	P	O	P(P1)	P(P2)	P(P3)	Mean
OLD RES						
O	2.48	6.07	6.57	5.73	5.22	
D	4.20	6.23	6.39	6.97	5.95	
N	2.84	6.33	6.62	6.12	5.48	
P	5.18	6.78	6.60	6.33	6.22	
NPKNAMG	4.59	6.17	5.91	7.08	5.94	
Mean	3.86	6.31	6.42	6.45	5.76	

GRAIN MEAN DM% 90.5

STRAW TONNES/HECTARE

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

	P	O	P(P1)	P(P2)	P(P3)	Mean
OLD RES						
O	0.88	2.20	3.07	2.54	2.17	
D	1.41	2.47	2.67	3.17	2.43	
N	1.27	2.71	2.47	2.53	2.25	
P	1.63	2.16	2.50	2.25	2.13	
NPKNAMG	1.42	2.26	2.30	2.97	2.24	
Mean	1.32	2.36	2.60	2.69	2.24	

STRAW MEAN DM% 89.0

PLOT AREA HARVESTED 0.00538

03/R/EX/4

K TEST

GRAIN TONNES/HECTARE

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

OLD RES

O	3.77
D	4.91
N*	3.99
PK	4.97
N*PK	4.69

Mean	4.47
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GRAIN MEAN DM% 90.5

STRAW TONNES/HECTARE

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

OLD RES

O	1.68
D	2.22
N*	1.80
PK	1.82
N*PK	2.19

Mean	1.94
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STRAW MEAN DM% 89.5

PLOT AREA HARVESTED 0.00538