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# Yields of the Field Experiments 1991

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## 91/R/EX/4 Exhaustion Land - S. Barley

### Rothamsted Research

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91/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 - Hoosfield.

The 136th year, s. barley.

For previous years see 'Details' 1967, 1973 and 74-90/R/EX/4.

**Treatments:** All combinations of:-

Whole plots

1. **OLD RES** Residues of manures applied annually 1876-1901:
  - O None
  - D Farmyard manure at 35 tonnes
  - 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** Phosphate applied annually from 1986 as superphosphate until 1987, triple superphosphate since:
  - O None
  - P1 44 kg P
  - P2 87 kg P
  - P3 131 kg P

plus all combinations of:-

1. **OLD RES** Residues of manures applied annually 1876-1901:
  - O None
  - D Farmyard manure at 35 tonnes
  - 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
2. **N91** Nitrogen fertilizer (kg N) as 'Nitro-Chalk' until 1985, as 'Nitram' since 1986 (basal until 1975, on a cyclic system since 1976):
  - 0
  - 48
  - 96
  - 144

**NOTE:** All plots of the combination **OLD RES**, P were given N at 144 kg as 'Nitram' and K at 83 kg as muriate of potash.

91/R/EX/4

**Basal applications:** Weedkiller: Fluroxypyr at 0.15 kg with the fungicide in 200 l. Fungicide: Fenpropimorph at 0.38 kg.

**Seed:** Triumph, seed dressed triadimenol and fuberidazole, sown at 130 kg.

**Cultivations, etc.:-** P and K applied: 20 Nov, 1990. Ploughed: 23 Nov. Spring-tine cultivated: 25 Mar, 1991. Rotary harrowed, seed sown: 26 Mar. N applied: 18 Apr. Weedkiller with fungicide applied: 16 June. Combine harvested: 29 Aug.

**PHOSPHATE PLOTS**

**GRAIN TONNES/HECTARE**

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

	P	O	P1	P2	P3	Mean
<b>OLD RES</b>						
O		2.54	4.96	5.42	5.72	4.66
D		4.31	5.22	5.50	5.49	5.13
N		2.35	5.10	5.50	5.86	4.70
P		3.76	5.18	5.24	5.50	4.92
NPKNAMG		3.69	5.14	5.42	5.53	4.94
Mean		3.33	5.12	5.42	5.62	4.87

GRAIN MEAN DM% 85.1

**STRAW TONNES/HECTARE**

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

	P	O	P1	P2	P3	Mean
<b>OLD RES</b>						
O		1.82	3.69	4.14	3.81	3.36
D		3.05	3.72	3.71	3.53	3.50
N		1.73	3.59	3.70	3.79	3.20
P		2.40	3.60	3.61	3.62	3.31
NPKNAMG		2.50	3.45	3.74	3.70	3.35
Mean		2.30	3.61	3.78	3.69	3.34

STRAW MEAN DM% 92.4

PLOT AREA HARVESTED 0.00588

91/R/EX/4

**NITROGEN PLOTS**

**GRAIN TONNES/HECTARE**

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

	N91	0	48	96	144	Mean
<b>OLD RES</b>						
O	0.73	1.75	0.74	0.91	1.03	
D	2.09	3.41	3.46	3.37	3.08	
N*	0.96	2.13	1.15	1.14	1.34	
PK	1.74	3.47	3.18	3.64	3.01	
N*PK	1.71	3.41	2.99	2.88	2.75	
Mean	1.44	2.83	2.30	2.39	2.24	

GRAIN MEAN DM% 82.5

**STRAW TONNES/HECTARE**

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

	N91	0	48	96	144	Mean
<b>OLD RES</b>						
O	1.44	1.54	1.80	1.98	1.69	
D	1.34	1.93	2.00	2.13	1.85	
N*	0.89	1.28	1.44	1.39	1.25	
PK	1.14	1.92	1.82	2.20	1.77	
N*PK	0.81	1.66	1.76	1.64	1.47	
Mean	1.12	1.67	1.76	1.87	1.60	

STRAW MEAN DM% 90.2

PLOT AREA HARVESTED 0.00588