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Results of the Classical and Other Long-term Experiments 2021

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21/R/EX/4 - Exhaustion Land (Hoosfield)

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21/R/EX/4 EXHAUSTION LAND (Hoosfield)

Object: To study the residual effects of manures applied 1856 - 1901, and of additional phosphate applied since 1986 (P test) and of additional potassium since 2007 (K test); on the yield of continuous spring barley up to 1991, winter wheat since – Hoosfield.

The 166th year, winter wheat.

For previous years see 'Details' 1977, 1973 and Yield Books for 74-20/R/EX/4

Treatments: All combinations of:

Whole plots (P test)

1. **OLD RES** Residues of manures applied annually 1876 – 1901:

Main plot

01	O	None
03	D	Farmyard manure at 35 t (fresh weight)
05	N	96 kg N as ammonium salts
09	P	34 kg P as superphosphate
07	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. In 2009 maintenance P applications were changed from 20 kg P/ha to 15 kg P/ha. This was not recorded in the yield books for 2009-13. (P1) (P2) and (P3) are residues of P applied annually. From 2016 onward P was withheld from the P(P1) sub-plots.

1986–1992:

	2016-Present	2009-2015	2000-08	1986-92
O	None	None	None	None
P (P1)	None	15 kg P	20 kg P	44 kg P
P (P2)	15 kg P	15 kg P	20 kg P	87 kg P
P (P3)	15 kg P	15 kg P	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:

Main Plot

02	O	None
04	D	Farmyard manure at 35 t (fresh weight)
06	N*	96 kg N as nitrate of soda
10	PK	34 kg P as superphosphate, 137 kg K as sulphate of potash
08	N*PK	N, P and K as above

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2. K Potassium applied annually from 2007 as muriate of potash

O	None (2 sub-plots within each treatment strip)
K1	75 kg K_2O (62.2 kg K)
K2	150 kg K_2O (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

Date		Application	Rate	Unit
21/09/2020	f	Applied Triple Superphosphate (TSP) using Cascade Spreader, JD6830: Plots 011, 012, 021-024, 031, 032, 041-044, 051, 052, 061-064, 071, 072, 081-084, 091, 092, 101-104	75	kg/ha
21/09/2020	p	Sprayed using Knight 24m Sprayer, NH T6030: Samurai (16238)	3	L/ha
21/09/2020	p	Sprayed using Knight 24m Sprayer, NH T6030: Buffalo Elite	1	L/ha
22/09/2020	f	Applied Muriate of Potash (MOP) using Cascade Spreader, JD6830: Plots 103, 083, 063, 043, 023	125	kg/ha
22/09/2020	f	Applied Muriate of Potash (MOP) using Cascade Spreader, JD6830: Plots 011-014, 024, 031-034, 044, 051-054, 064, 071-074, 084, 091-094, 104	250	kg/ha
07/10/2020	a	Path cutting using Kilworth Topper, Iseki ISTH4335	-	-
19/10/2020	a	Ploughed Tillage 20 cm using NHT7210, KV Five Furrow Plough: Thrown N	-	-
19/10/2020	s	Drilled using JD6830, Accord Combination Drill No. 4: KWS Zyatt	350	seeds/m^2
01/12/2020	p	Sprayed using Knight 24m Sprayer, NH T6030: Hallmark with Zeon Technology	50	mL/ha
02/12/2020	p	Sprayed using Knight 24m Sprayer, NH T6030: Pontos	0.5	L/ha
02/12/2020	p	Sprayed using Knight 24m Sprayer, NH T6030: Firestarter	0.6	L/ha
02/12/2020	p	Sprayed using Knight 24m Sprayer, NH T6030: Velomax	0.4	L/ha
04/04/2021	a	Cultivated Paths only		
21/04/2021	f	Applied Sulphate of Ammonia using Cascade Spreader, JD6830: All Plots	238	kg/ha
12/05/2021	f	Applied Kieserite using Cascade Spreader, JD6830: All Plots	80	kg/ha
12/05/2021	p	Sprayed using Knight 24m Sprayer, NH T6030: Lentyma XE	1	L/ha
26/05/2021	f	Applied Nitram using Cascade Spreader, JD6830 : All Plots	580	kg/ha
09/06/2021	f	Applied Nitram using Cascade Spreader, JD6830: All Plots	145	kg/ha
23/06/2021	p	Sprayed using Knight 24m Sprayer, NH T6030: Cello	0.66	L/ha

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15/07/2021	a	Power harrowed Paths using Iseki ISTH4335, Kilworth Power Harrow 1.3 m	-	-
02/08/2021	a	Path Cutting using Iseki ISTH4335, Kilworth Topper	-	-
11/08/2021	p	Sprayed using Knight 24m Sprayer, NH T6030: Samurai	3	L/ha
11/08/2021	p	Sprayed using Knight 24m Sprayer, NH T6030: Buffalo Elite	1	L/ha
26/08/2021	A	Harvest Surrounds using Claas Tucano 430	-	-
26/08/2021	a	Harvest Plots using Haldrup C-85 2m cut	-	-
27/08/2021	a	Straw weights using JD5070, Amazone Grass Harvester - Flail Mower Collector	-	-

Yields

P TEST

Tables of means

Grain Yield, tonnes/hectare

P_RES OLD_RES	O	(P1)	(P2)	(P3)	Mean
O	2.35	4.40	6.27	6.36	4.85
D	3.00	6.11	7.48	7.05	5.91
N	2.05	4.30	6.40	6.93	4.92
P	2.67	5.97	7.18	6.96	5.69
NPKNAMG	2.04	5.68	7.00	7.12	5.46
Mean	2.42	5.29	6.86	6.88	5.36
Grain mean DM%	85.00				

Straw Yield, tonnes/hectare

P_RES OLD_RES	O	(P1)	(P2)	(P3)	Mean
O	0.49	1.42	1.09	1.35	1.09
D	0.84	2.11	2.13	2.03	1.78
N	0.49	1.17	2.20	3.03	1.72
P	0.87	2.34	2.79	2.31	2.08
NPKNAMG	1.44	1.68	1.84	2.20	1.79
Mean	0.83	1.74	2.01	2.18	1.69
Straw mean DM%	85.20				

Plot area harvested 0.00512 ha.

K TEST

Tables of means

Grain Yield, tonnes/hectare

K_Test OLD_RES	K0	K1	K2	Mean
O	6.02	6.78	6.97	6.45
D	7.36	8.25	7.26	7.56
N*	6.82	7.40	6.85	6.97
PK	6.64	5.88	5.95	6.28
N*PK	7.06	7.70	7.72	7.38
Mean	6.78	7.20	6.95	6.93
Grain mean DM%	85.20			

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Straw Yield, tonnes/hectare

K_Test	K0	K1	K2	Mean
OLD_RES				
O	2.78	2.87	2.69	2.78
D	2.31	2.50	2.64	2.44
N*	2.21	2.91	1.66	2.25
PK	2.20	3.13	2.62	2.54
N*PK	2.02	3.29	2.50	2.46
Mean	2.30	2.94	2.42	2.49
Straw mean DM%	84.10			

Plot area harvested 0.00512 ha

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