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71/W/RN/14 Long-term Phosphate - Barley, Potatoes

Rothamsted Research

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71/W/RN/14

LONG TERM PHOSPHATE

Object: To study direct and residual effects of superphosphate on yields of three crops grown in rotation - Woburn Stackyard III.

The fourth year, barley and potatoes.

For previous years see 68/B/8(t), 69/W/RN/14 and 70/W/RN/14(t).

Design: 6 blocks of 6 plots, split into 2.

Whole plot dimensions: 8.53 x 15.8. Area harvested: Barley - 0.00442, potatoes - 0.00451.

Treatments:

Sub plots: Superphosphate:

Barley: None (0), 63 kg P₂O₅ (P).

Potatoes: None (0), 188 kg P₂O₅ (P).

Basal applications:-

Barley: Manures: 2510 kg ground chalk, 61 kg of K₂O as muriate of potash, 148 kg N as 'Nitro-Chalk' 21. Weedkiller: Ioxynil at 0.525 kg and mecoprop at 1.58 kg in 281 l.

Potatoes: Manures: 2510 kg ground chalk, 258 kg of K₂O as muriate of potash in autumn, 250 kg of K₂O as muriate of potash in spring, 251 kg N as 'Nitro-Chalk' 21, 99 kg MgO as Epsom salts. Weedkiller: Linuron at 1.12 kg in 371 l. Fungicide and insecticide: Mancozeb at 1.34 kg and demeton-s-methyl at 246 ml in 416 l. Fungicide: Mancozeb at 1.34 kg in 371 l.

Cultivations, etc.:

Barley: Ground chalk applied: 26 Nov, 1970. Ploughed: 10 Dec. N and K applied: 1 Mar, 1971. P applied: 4 Mar. Seed drilled at 157 kg: 23 Mar. Power harrowed, redrilled because of bird damage: 13 Apr. Sprayed weedkiller: 18 May. Combine harvested: 25 Aug. Variety: Julia.

Potatoes: Sub soiled, tines 142 cm apart and 61 cm deep, ground chalk and K applied: 11 Sept, 1970. Deep-tine cultivated: 12 Sept. Ploughed: 21 Oct. P applied: 29 Mar, 1971. N, K and Mg applied: 1 Apr. Rotary cultivated, potatoes planted: 2 Apr. Weedkiller applied: 5 May. Rotary ridged: 1 June. Fungicide with insecticide applied: 28 June. Fungicide applied: 12 Aug. Haulm destroyed mechanically: 13 Sept. Lifted: 14 Sept. Variety: Pentland Crown.

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Standard errors per plot.

Barley: Grain, tonnes/hectare: Whole plot: 0.234 or 6.0% (9 d.f.)
Sub plot: 0.343 or 8.8% (10 d.f.)
Potatoes: Total tubers, tonnes/hectare:
Whole plot: 2.71 or 7.1% (10 d.f.)
Sub plot: 3.88 or 10.1% (12 d.f.)

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SUMMARY OF RESULTS

BARLEY

	RO*	R1	R2	R4	R6	Mean
GRAIN: TONNES/HECTARE						
	(1) & (2)		(3) & (4)			(±0.081)
O	3.15	3.67	3.91	4.08	4.21	3.69
P	3.81	4.31	3.98	4.45	4.37	4.12
Mean	3.48 (±0.096)	3.99	3.94 (±0.135)	4.26	4.29	3.91

- (1) (±0.138) (3) (±0.194) For use in horizontal and diagonal comparisons only
 (2) (±0.140) (4) (±0.198) For use in vertical and interaction comparisons only

STRAW: TONNES/HECTARE

O	2.11	2.65	2.87	3.04	2.87	2.61
P	2.76	2.98	2.83	3.10	3.15	2.93
Mean	2.43	2.81	2.85	3.07	3.01	2.77

Mean D.M. %: Grain: 80.6
 Straw: 83.5

* Duplicated treatment

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POTATOES

	RO*	R1	R2	R4	R6	Mean
TOTAL TUBERS: TONNES/HECTARE						
	(1) & (2)		(3) & (4)			(±0.91)
O	32.1	34.4	37.0	41.8	38.4	36.0
P	38.5	42.0	43.2	41.7	40.1	40.7
Mean	35.3 (±1.11)	38.2	40.1 (±1.56)	41.8	39.2	38.3

- (1) (±1.57) (3) (±2.23) For use in horizontal and diagonal comparisons only
 (2) (±1.58) (4) (±2.24) For use in vertical and interaction comparisons only

WARE: 3.81 CM (1.5 INCH) RIDDLE

O	97.7	97.2	97.8	98.0	97.2	97.6
P	97.1	96.8	97.7	97.4	97.0	97.2
Mean	97.4	97.0	97.7	97.7	97.1	97.4

* Duplicated treatment