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71/W/RN/13 Intensive Cereals - Ley, Potatoes, Wheat, Barley

Rothamsted Research

Rothamsted Research (1972) *71/W/RN/13 Intensive Cereals - Ley, Potatoes, Wheat, Barley* ; Yields Of The Field Experiments 1971, pp 111 - 115 - DOI: <https://doi.org/10.23637/ERADOC-1-97>

71/W/RN/13

INTENSIVE CEREALS

Object: To study the effects of intensive cereal cropping on yield, incidence of soil-borne diseases and organic matter in the soil-Woburn Stackyard I.

The sixth year, ley, potatoes, winter wheat, barley.

For previous years see 66/B/9(t), 67/B/9, 68/B/7(t) and 69-70/W/RN/13(t).

Design: For each cereal: 2 randomised blocks of 6 plots, split into 4.

Whole plot dimensions: 8.53 x 20.4. Sub plot area harvested:

Potatoes - 0.00343, wheat - 0.00271, barley - 0.00277.

NOTE: The magnesium test on all crops is now ended.

Basal applications: All crops: 5020 kg magnesian limestone three-quarters ploughed in, a quarter applied to plough furrow. 126 kg P2O5, 252 kg K2O as (0:14:28), half ploughed in, half applied to plough furrow.

Weedkiller: Paraquat at 1.12 kg ion in 281 l.

Ley: 63 kg N in seedbed, 63 kg N 8 weeks after sowing, 75 kg N after each cut except the last as 'Nitro-Chalk' 21.

Potatoes: 150 kg N as 'Nitro-Chalk' 21. Weedkiller: Linuron at 1.12 kg in 371 l. Fungicide: Mancozeb at 1.34 kg in 416 l on the first occasion, and 371 l on the second. Insecticide: Demeton-s-methyl at 246 ml applied with first mancozeb spray.

Wheat and barley: Weedkiller: Ioxynil at 0.53 Kg and mecoprop at 1.58 kg in 281 l.

Cultivations, etc.: All plots: Paraquat applied: 16 Sept, 1970. Half PK applied: 24 Sept. Three-quarters magnesian limestone applied: 6 Oct. Ploughed: 10 Oct. Remaining PK and magnesian limestone applied: 14 Oct.

Leys: Deep-tine cultivated barley blocks: 21 Oct, 1970. N applied: 1 Apr. Seeds sown at 33 kg: 22 Apr. First cut: 16 July. N applied: 19 July. Second cut: 8 Sept. Variety: Italian Ryegrass S22.

Potatoes: Deep-tine cultivated barley blocks: 21 Oct, 1970. N applied: 29 Mar, 1971. Rotary cultivated, potatoes planted: 30 Mar. Weedkiller applied: 5 May. Rotary ridged: 1 June. Fungicide plus insecticide applied: 28 June. Fungicide applied: 12 Aug. Haulm mechanically destroyed: 13 Sept. Lifted: 14 Sept. Variety: Majestic.

Wheat: Seed drilled at 191 kg: 14 Oct, 1970. N applied: 14 Apr, 1971. Weedkiller applied: 28 Apr. Combine harvested: 28 Aug. Variety: Cappelle.

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Barley: Deep-tine cultivated: 21 Oct, 1970. N applied, seed drilled at 157 kg: 17 Mar, 1971. Power harrowed, re-drilled at 157 kg: 9 Apr. Weedkiller applied: 18 May. Combine harvested: 25 Aug. Variety: Julia.

NOTE: Estimates of eyespot (*Cercospora herpotrichoides*) and take-all (*Ophiobolus graminis*) were made on both cereal crops.

Standard errors per sub plot.

Wheat, grain, tonnes/hectare: Sub plot: 0.391 or 10.6% (12 d.f.)

Barley, grain, tonnes/hectare: Sub plot: 0.194 or 4.5% (11 d.f.)

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SUMMARY OF RESULTS

POTATOES

N: KG/HA 1969

63	126	189	252	Mean
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PERMANENT WHEAT BLOCKS

TOTAL TUBERS: TONNES/HECTARE

33.0	32.2	36.7	36.8	34.7
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% WARE: 3.81 CM (1.5 INCH) RIDDLE

94.1	93.1	95.1	95.3	94.4
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PERMANENT BARLEY BLOCKS

TOTAL TUBERS: TONNES/HECTARE

46.0	42.9	44.3	48.7	45.5
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% WARE: 3.81 CM (1.5 INCH) RIDDLE

93.5	92.9	94.4	93.8	93.6
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WINTER WHEAT

Crop in					N: KG/HA				
1966	1967	1968	1969	1970	63	126	189	252	Mean
GRAIN: TONNES/HECTARE									
					(1) and (2)				(±0.209)
W	W	W	L	P	3.22	4.77	4.97	4.63	4.40
W	W	L	P	W	2.70	3.95	3.96	3.59	3.55
W	L	P	W	W	2.09	3.53	4.03	4.19	3.46
W	W	W	W	W	2.88	3.55	3.85	3.17	3.36
Mean (±0.138)					2.72	3.95	4.20	3.90	3.69

(1) (±0.317) For use in vertical and diagonal comparisons only

(2) (±0.276) For use in horizontal and interaction comparisons only

Mean D.M. %: 82.1

					STRAW: TONNES/HECTARE				Mean
W	W	W	L	P	3.32	4.06	4.15	3.70	
W	W	L	P	W	2.64	3.87	3.95	3.82	3.57
W	L	P	W	W	2.58	3.38	3.96	4.41	3.58
W	W	W	W	W	3.02	3.66	4.04	3.77	3.62
Mean					2.89	3.74	4.02	3.93	3.64

Mean D.M. %: 87.1

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BARLEY

Crop in					N: KG/HA				
1966	1967	1968	1969	1970	63	126	189	252	Mean
GRAIN: TONNES/HECTARE									
					(1) and (2)				(±0.147)
B	B	B	L	P	3.59	4.58	4.40	4.82	4.35
B	B	L	P	B	3.82	4.55	5.14	5.36	4.72
B	L	P	B	B	3.71	4.64	4.82	4.69	4.47
B	B	B	B	B	3.07	3.62	4.34	4.64	3.92
Mean (±0.069)					3.55	4.35	4.67	4.88	4.36

(1) (±0.189) For use in vertical and diagonal comparisons only

(2) (±0.138) For use in horizontal and interaction comparisons only

Mean D.M. %: 82.4

STRAW: TONNES/HECTARE

B	B	B	L	P	2.48	3.30	3.55	3.94	3.32
B	B	L	P	B	2.16	2.87	3.94	3.92	3.22
B	L	P	B	B	2.20	3.17	3.71	3.62	3.18
B	B	B	B	B	1.85	2.83	3.42	3.91	3.00
Mean					2.17	3.04	3.66	3.85	3.18

Mean D.M. %: 87.4