ROTHAMSTED RESEARCH

Yields of the Field Experiments 1978

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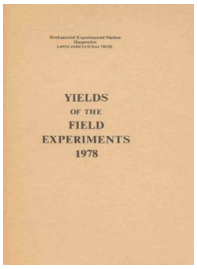

78/W/RN/6 Arable Reference Plots - Oats, Sugar Beet, Barley, Ley, Potatoes, Permanent Grass

Rothamsted Research

Rothamsted Research (1979) *78/W/RN/6 Arable Reference Plots - Oats, Sugar Beet, Barley, Ley, Potatoes, Permanent Grass ;* Yields Of The Field Experiments 1978, pp 86 - 89 **- DOI: https://doi.org/10.23637/ERADOC-1-30**

78/W/RN/6

ARABLE REFERENCE PLOTS

Object: To study the long term effects of FYM and N, P and K fertilisers on the yield and mineral content of crops - Woburn Stackyard C.

Sponsor: F.V. Widdowson.

The 19th year, oats, sugar beet, barley, ley, potatoes, permanent grass.

For previous years see 60/B/3(t), 61-65/B/2, 66/B/2(t), 67/B/2(t), 68/B/3(t), 69/W/RN/6, 70/W/RN/6(t) and 71-77/W/RN/6.

Design: 1 block of 12 plots for each crop.

Whole plot dimensions: 2.74 x 2.13.

Treatments: All combinations of:-

Blocks

1. CROP	Crops:-
	After old grass (1960-73):
S BEET/G	Sugar beet
	In arable rotation since 1960:
BARLEY	Barley
LEY	Ley
POTATOES	Potatoes
S BEET/A	Sugar beet
OATS	Oats
Also:	
PERMGRAS	Permanent grass, sown autumn 1973

Plots

2. MANURE — Fertilisers and farmyard manure:-

0
N1
P
N1P
K
N1K
PK
N1PK
N2PK
D
N1PKD
N2PKD

N1,2 (kg N): 31.5, 63 (ley): 63, 126 (barley and oats): 126, 252 (sugar beet and potatoes): 188, 376 (permanent grass) as ammonium nitrate.
P: P205 at 63 kg as triple superphosphate.
K: K20 at 252 kg as potassium bicarbonate.
D: Farmyard manure at 25 tonnes (permanent grass): 50 tonnes (sugar beet and potatoes): none to other crops.

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NOTES: (1) The old grass block was dug in autumn 1973 and follows the arable rotation, the crop in 1978 being sugar beet. A new block was sown to permanent grass in 1974.
(2) Potatoes and sugar beet test on sub plots: - v MG (82 kg MgO as Epsom salts). Yields are recorded from potatoes only. Untreated sub plots receive 82 kg MgO after potato and sugar beet harvest.

Standard applications:
Winter oats: Insecticide: Phorate granules at 2 kg. Weedkillers: Ioxynil at 0.63 kg plus mecoprop at 1.9 kg in 280 l.
Sugar beet: Manures: Boron at 0.92 kg B_2O_3 as borax in 1120 l. Insecticide: Pirimicarb at 0.14 kg in 280 l.
Barley: Weedkillers: Ioxynil at 0.52 kg plus mecoprop at 1.6 kg in 280 l with the fungicide. Fungicide: Tridemorph at 0.53 kg.
Potatoes: Weedkillers: Linuron at 1.0 kg plus paraquat at 0.28 kg ion in in 280 l. Insecticide: Pirimicarb at 0.14 kg in 280 l. Fungicide: Mancozeb at 1.3 kg in 280 l.

Seed: Winter oats: Peniarth, sown at 210 kg.
Sugar beet: Klein E, sown at 5.6 kg.
Barley: Wing, sown at 180 kg.
Potatoes: Pentland Crown.
Grass-clover ley: RvP Italian ryegrass and Hungaropoly red clover.
Permanent Grass: S215 Meadow fescue at 20 kg; S24 perennial ryegrass at 20 kg; crested dogstail at 7 kg; chewings fescue at 7 kg; smooth stalked meadow grass at 7 kg; alsike clover at 4 kg; wild white clover at 2 kg. Mixture sown at 67 kg.

Cultivations, etc.:-
Winter Oats: Balancing Mg applied after potatoes: 3 Oct, 1977. P and K applied, raked, phorate applied, raked, seed sown, raked: 20 Oct. First half N applied: 21 Mar, 1978. Weedkiller applied: 31 Mar. Second half N applied: 12 May. Harvested: 10 Aug.
Sugar beet: FYM applied to block after old arable and plots in this block only dug by hand: 6 Dec, 1977. FYM applied to block after old grass and plots in this block only dug by hand: 9 Dec. P and K applied: 20 Feb, 1978. First N applied, raked, Mg applied to half plots, seed sown, raked in: 21 Mar. Second N applied, boron applied, singled: 14 June. Insecticide applied: 13 July. Lifted: 25 Oct.
Barley: Plots dug by hand: 9 Dec, 1977. P and K applied: 20 Feb, 1978. First N applied, raked, seed sown, raked: 6 Mar. Second N applied: 12 May. Weedkiller and fungicide applied: 19 May. Harvested: 11 Aug.
Potatoes: FYM applied, plots dug by hand: 5 Dec, 1977. P and K applied: 20 Feb, 1978. First N applied, rotary cultivated, Mg applied to half plots, potatoes planted and earthed up: 12 May. Weedkiller applied: 25 May. Second N applied: 14 June. Insecticide and fungicide applied: 13 July. Lifted plots without K: 10 Aug. Remaining plots lifted: 2 Oct.
Grass-clover ley: Barley stubble raked, seeds sown, raked in: 11 Aug, 1977. P and K applied: 12 Dec. N applied: 7 Mar, 1978. Cut three times: 5 June, 1 Aug, 16 Oct.
Permanent Grass: P and K applied: 10 Nov, 1977. FYM applied: 20 Feb, 1978. N applied in three equal amounts: 7 Mar, 5 June, 1 Aug. Cut three times: 5 June, 1 Aug, 16 Oct.

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NOTES: (1) Samples were taken for determination of dry matter for each crop and the percentage N, P and K.
(2) The percentages of Mg in sugar beet tops, potato tubers and leaves were determined.
(3) The percentage of K in potato leaves in July was determined.

TONNES/HECTARE

***** TABLES OF MEANS *****

	S BEET/G							
	ROOTS WASHED	SUGAR %	TOTAL SUGAR	TOPS	BARLEY GRAIN	BARLEY STRAW	OATS GRAIN	OATS STRAW
MANURE								
0	17.8	17.4	3.10	10.9	1.71	1.50	1.49	1.62
N1	27.3	17.6	4.82	22.2	3.38	3.03	3.25	3.46
P	20.3	18.2	3.71	11.8	1.68	1.75	1.45	1.53
N1P	13.5	16.9	2.27	16.1	2.50	2.67	2.85	3.14
K	22.9	18.2	4.17	12.1	1.57	1.54	1.48	1.61
N1K	37.6	18.6	6.99	22.7	3.57	3.09	3.47	5.30
PK	19.8	17.5	3.48	9.4	1.58	1.60	2.05	2.72
N1PK	32.8	18.4	6.05	19.5	5.29	4.47	4.26	6.71
N2PK	36.2	18.9	6.86	23.8	5.61	5.17	4.71	6.52
D	38.3	19.4	7.44	21.9	2.84	2.66	2.35	3.07
N1PKD	46.0	19.9	9.13	23.8	5.59	5.48	4.13	6.73
N2PKD	46.1	19.1	8.79	31.3	5.75	6.12	5.46	9.26
MEAN DM%					78.6	74.1	78.8	46.1

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TONNES/HECTARE

***** TABLES OF MEANS *****

	LEY : DRY MATTER				POTATOES		
	1ST CUT	2ND CUT	3RD CUT	TOTAL OF 3 CUTS	-	TOTAL TUBERS MG	MEAN
MANURE							
0	2.36	1.05	1.09	4.51	8.9	5.1	7.0
N1	3.62	0.83	0.95	5.40	10.3	10.9	10.6
P	2.89	0.88	1.04	4.81	8.2	7.5	7.9
N1P	3.97	0.74	0.72	5.44	9.9	13.0	11.4
K	3.58	2.42	2.24	8.24	7.2	8.5	7.9
N1K	5.36	2.37	2.21	9.93	5.8	8.2	7.0
PK	4.99	2.67	2.27	9.92	17.4	16.7	17.1
N1PK	6.09	2.55	2.55	11.19	15.7	20.8	18.3
N2PK	5.73	1.84	2.16	9.73	46.1	49.2	47.7
D	4.64	2.55	2.37	9.56	27.0	30.1	28.5
N1PKD	6.50	2.70	2.45	11.65	42.0	47.2	44.6
N2PKD	7.12	2.11	2.11	11.34	50.6	47.2	48.9
MEAN DM%	26.1	24.1	28.3	26.1			

	S BEET/A				PERMGRAS : DRY MATTER			
	ROOTS WASHED	SUGAR %	TOTAL SUGAR	TOPS	1ST CUT	2ND CUT	3RD CUT	TOTAL OF 3 CUTS
MANURE								
0	14.2	16.9	2.40	6.8	2.48	0.63	0.74	3.85
N1	21.2	17.5	3.71	15.0	3.81	1.24	1.65	6.71
P	12.5	16.8	2.10	6.8	2.18	0.69	0.78	3.65
N1P	16.1	16.8	2.71	14.2	4.55	1.03	1.80	7.38
K	15.5	17.9	2.78	6.8	3.33	1.07	1.01	5.41
N1K	33.5	18.5	6.21	18.6	5.49	1.29	1.90	8.68
PK	11.8	16.8	1.98	6.8	3.48	1.30	1.05	5.83
N1PK	35.9	19.5	6.99	17.9	5.09	1.28	2.10	8.47
N2PK	41.0	17.9	7.33	29.6	6.34	1.55	2.55	10.44
D	30.8	18.1	5.57	21.0	4.66	0.67	0.92	6.24
N1PKD	44.4	18.8	8.34	28.7	5.73	1.16	2.12	9.01
N2PKD	57.1	17.8	10.15	42.0	6.42	1.78	2.80	11.00
MEAN DM%					24.6	23.3	31.4	26.4

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