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Yields of the Field Experiments 1973

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73/S/RN/2 - Rotation II - Potatoes, Barley, Sugar Beet

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ROTATION II

Object: To measure, by crop yields and soil analysis, the residual value of P applied as FYM or superphosphate in the periods 1899-1964 and 1965-1967 - Saxmundham.

Sponsors: G.E.G. Mattingly, A.E. Johnston.

The fifth year of revised scheme, potatoes, barley, sugar beet.

For previous years see 'Details' 1967, 68/A/10(t), 69/S/RN/2(t) and 70-72/S/RN/2.

Treatments: From 1899-1964 the experiment tested farmyard manure and nitrogen and phosphate fertilisers applied to a rotation of crops. Since 1965 the treatments have been changed to evaluate old residues of P (from FYM and superphosphate) and new residues from treatments applied 1965-1967. The experiment now tests all combinations of:-

Half blocks: 1. Crops (in rotation potatoes, barley, sugar beet, barley):- CROP

Potatoes	Potatoes
Barley	BafterP
Sugar beet	SugrBeet
Barley	BafterSB

Whole plots: 2. Residues of previous treatments:- RESIDUE

	Approximate total dressing 1899-1964	Total dressing 1965-1967	
Plot 1	None	None	(O)O
Plot 2	400 tonnes FYM	None	(D)O
Plot 3	400 tonnes FYM, 2.7 tonnes P2O5	None	(DP)O
Plot 4	400 tonnes FYM, 2.7 tonnes P2O5	100 tonnes FYM	(DP)D2
Plot 5	400 tonnes FYM, 2.7 tonnes P2O5	100 tonnes FYM, 0.56 tonnes P2O5	(DP)D2P1
Plot 6	400 tonnes FYM, 2.7 tonnes P2O5	0.56 tonnes P2O5	(DP)P1
Plot 7	400 tonnes FYM, 2.7 tonnes P2O5	1.13 tonnes P2O5	(DP)P2
Plot 8	326 tonnes FYM, 4.3 tonnes P2O5 (until 1952 only)	None	(DP52)O

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Sub plots:	3. Phosphate residues 1970-1972 (total P2O5 applied, kg)	P2O5RES
	None (2 sub plots/plot)	(0)
	126	(126)
	252	(252)
	378	(378)

Potatoes and sugar beet test in addition some of the combinations of 3 with

	4. Phosphate in 1973 (kg P2O5)	P2O573
	None	0
	63	63
	189	189

Whole plot dimensions: 3.56 x 5.49. Sub plot area harvested:
 Potatoes: 0.00078, barley: 0.00056, sugar beet: 0.00100.

Standard applications:

Potatoes: Manures: K2O at 380 kg as muriate of potash before ploughing: (25:0:16) at 1000 kg to seedbed. Weedkiller: Linuron at 0.84 kg plus paraquat at 0.42 kg ion in 340 l. Insecticide: Menazon ('Saphi-Col' at 0.7 l in 340 l) on 3 occasions. Fungicide: Mancozeb at 1.4 kg in 340 l on 4 occasions.
 Barley: Manures: (25:0:16) at 400 kg. Weedkiller: Dichlorprop plus MCPA ('Mephetol Plus' at 5.6 l in 340 l). Fungicide: Tridemorph at 5.3 kg applied with the weedkiller.
 Sugar beet: Manures: K2O at 380 kg as muriate of potash before ploughing: (25:0:16) at 750 kg to seedbed. Insecticide: Menazon ('Saphi-Col' at 0.7 l in 340 l) on 5 occasions.

Seed: Potatoes: King Edward
 Barley: Julia, dressed with ethirimol, sown at 170 kg.
 Sugar beet: Klein E rubbed and graded, sown at 18 kg.

Cultivations, etc.:-

Potatoes: Autumn K applied: 22 Sept, 1972. Ploughed: 25 Oct. Basal NK and test P applied: 27 Mar, 1973. Potatoes planted: 16 Apr.
 Weedkiller applied: 15 May. Insecticide applied: 13 June, 28 June, 10 and 26 July. Fungicide applied: 28 June, 10 and 26 July, 8 and 16 Aug. Harvested by hand: 18 Sept.

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Barley: Ploughed: 25 Oct, 1972. Seed sown and basal NK applied:
20 Mar, 1973. Weedkiller and fungicide applied: 20 May.
Harvested by hand: 14 Aug.
Sugar beet: Autumn K applied: 22 Sept, 1972. Ploughed: 25 Oct.
Basal NK and test P applied, seed sown: 27 Mar, 1973. Singled:
15 May. Insecticide applied: 13 and 28 June, 10 and 26 July,
8 Aug. Lifted: 15 Oct.

Standard errors per plot.

Barley: After potatoes: Grain, tonnes/hectare: 0.586 or 12.8%
(8 d.f.)
After sugar beet: Grain, tonnes/hectare: 0.250 or
5.0% (8 d.f.)

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TABLES OF MEANS

ROTATION 2

POTATOES

TOTAL TUBERS: TONNES/HECTARE

P205RES P20573	(0) 0	(0) 63	(0) 189	(126) 63	(126) 189	(252) 63	(252) 189	(378) 63	(378) 189
RESIDUE									
(0)0	26.2	33.7			45.3	45.9			46.8
(D)0	38.1		51.1	45.6			43.6	42.4	
(DP)0	41.8		47.4	42.4			47.4	46.5	
(DP)D2	38.1	46.2			46.2	43.6			47.1
(DP)D2P1	45.6		50.3	49.4			48.8	46.5	
(DP)P1	46.8		49.4	43.3			48.5	47.4	
(DP)P2	42.1	44.8			47.1	47.1			48.2
(DP52)0	37.5	48.0			41.0	41.8			50.0

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SUGAR BEET

P205RES (0) (0) (0) (126) (252) (378)
 P20573 0 63 189 63 189 63 189 63 189

RESIDUE	ROOTS(WASHED): TONNES/HECTARE									
	(0)	(0)	(0)	(126)	(126)	(252)	(252)	(378)	(378)	(378)
(O)O	7.2		43.6	38.4			47.3	44.9		
(D)O	30.9	49.4			49.1	44.2				42.3
(DP)O	45.3	48.5			43.0	51.4				43.3
(DP)D2	50.0		48.4	48.6			47.5	50.8		
(DP)D2P1	52.3	50.9			48.4	45.5				51.0
(DP)P1	49.2	49.3			48.4	53.8				49.4
(DP)P2	46.8		53.6	45.9			49.0	47.6		
(DP52)O	49.3		55.0	47.0			51.0	47.4		
	SUGAR PERCENTAGE									
(O)O	13.5		16.7	17.0			17.1	16.9		
(D)O	15.4	17.4			17.3	17.0				17.1
(DP)O	17.3	17.8			17.3	17.0				17.3
(DP)D2	17.2		17.8	17.4			17.3	17.5		
(DP)D2P1	16.8	16.8			17.2	16.6				17.2
(DP)P1	16.9	17.4			17.4	16.5				17.2
(DP)P2	17.0		16.8	16.4			16.8	17.0		
(DP52)O	16.8		17.2	16.9			16.7	16.0		
	TOTAL SUGAR: TONNES/HECTARE									
(O)O	0.97		7.28	6.51			8.12	7.58		
(D)O	4.76	8.61			8.49	7.49				7.22
(DP)O	7.35	8.63			7.42	8.73				7.49
(DP)D2	8.63		8.60	8.45			8.22	8.88		
(DP)D2P1	8.80	8.57			8.34	7.58				8.78
(DP)P1	8.33	8.59			8.44	8.87				8.48
(DP)P2	7.97		9.03	7.54			8.22	8.09		
(DP52)O	8.28		9.46	7.96			8.54	7.58		

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SUGAR BEET

P205RES (0) (0) (0) (126) (252) (378)
 P20573 0 63 189 63 189 63 189 63 189

TOPS: TONNES/HECTARE									
RESIDUE									
(O)O	10.5		27.8	29.0			31.1	23.8	
(D)O	25.8	33.1			25.4	33.5			30.2
(DP)O	30.7	29.4			27.8	33.1			25.8
(DP)D2	32.7		30.7	31.9			29.8	24.2	
(DP)D2P1	28.6	32.3			34.7	28.6			35.1
(DP)P1	35.1	32.7			32.7	39.1			34.3
(DP)P2	33.9		29.8	35.1			35.5	31.5	
(DP52)O	39.5		35.1	36.7			33.1	41.1	
PLANT NUMBER: THOUSANDS/HECTARE									
(O)O	84.7		117.6	111.6			106.6	101.7	
(D)O	120.6	113.6			102.7	128.6			108.6
(DP)O	106.6	113.6			113.6	111.6			117.6
(DP)D2	110.6		111.6	117.6			107.6	105.6	
(DP)D2P1	110.6	116.6			110.6	107.6			96.7
(DP)P1	116.6	110.6			116.6	119.6			112.6
(DP)P2	94.7		98.7	113.6			120.6	98.7	
(DP52)O	125.6		115.6	104.6			117.6	109.6	

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BARLEY AFTER POTATOES

P205RES

	(0)	(126)	(252)	(378)	Mean
GRAIN: TONNES/HECTARE					
RESIDUE					
(0)0	4.51	5.15	5.47	6.01	5.13
(D)0	4.50	3.85	4.50	5.22	4.51
(DP)0	4.40	3.50	4.44	4.41	4.23
(DP)D2	4.67	5.11	4.32	4.40	4.63
(DP)D2P1	4.63	5.23	4.68	4.71	4.78
(DP)P1	4.37	4.02	4.01	4.04	4.16
(DP)P2	5.51	4.28	3.80	5.27	4.87
(DP52)0	4.14	4.44	3.73	5.22	4.33
Mean	4.59	4.45	4.37	4.91	4.58

Mean D.M. % 86.8

STANDARD ERRORS OF DIFFERENCES

	P205RES	RESIDUE* P205RES
0 v any of remainder	0.256	0.718
Between any of remainder	0.293	0.829

* Within the same level of RESIDUE only

STRAW: TONNES/HECTARE

(0)0	3.92	4.59	4.97	5.50	4.58
(D)0	4.88	5.30	5.91	6.04	5.40
(DP)0	4.98	4.73	5.60	5.19	5.10
(DP)D2	5.68	5.24	4.85	5.05	5.30
(DP)D2P1	5.30	5.77	6.10	5.10	5.51
(DP)P1	4.88	4.96	5.58	5.43	5.14
(DP)P2	4.34	4.76	5.17	5.14	4.75
(DP52)0	5.17	5.18	5.15	5.23	5.18
Mean	4.89	5.07	5.41	5.34	5.12

Mean D.M. % 73.6

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 BARLEY AFTER SUGAR BEET
 P205RES

	(0)	(126)	(252)	(378)	Mean
GRAIN: TONNES/HECTARE					
RESIDUE					
(O)O	2.15	4.89	5.28	6.19	4.13
(D)O	5.02	4.94	5.55	4.72	5.05
(DP)O	5.47	5.45	4.44	5.62	5.29
(DP)D2	5.33	5.83	5.26	5.82	5.51
(DP)D2P1	5.21	5.27	5.14	5.50	5.26
(DP)P1	5.04	5.60	5.05	4.62	5.07
(DP)P2	4.90	5.54	4.87	4.65	4.97
(DP52)O	5.34	5.44	5.01	4.60	5.14
Mean	4.81	5.37	5.07	5.21	5.05

Mean D.M.% 86.3

STANDARD ERRORS OF DIFFERENCES

	P205RES	RESIDUE* P205RES
O v any of remainder	0.108	0.306
Between any of remainder	0.125	0.354

* Within the same level of RESIDUE only

STRAW: TONNES/HECTARE					
(O)O	2.79	4.65	5.39	5.92	4.31
(D)O	4.67	4.71	5.89	5.79	5.15
(DP)O	5.14	5.33	5.53	6.11	5.45
(DP)D2	5.76	6.64	5.89	6.41	6.09
(DP)D2P1	6.07	5.78	6.79	5.90	6.12
(DP)P1	6.05	6.77	5.91	5.69	6.09
(DP)P2	5.91	6.10	5.72	5.89	5.91
(DP52)O	5.93	5.91	5.38	5.65	5.76
Mean	5.29	5.74	5.81	5.92	5.61

Mean D.M. % 77.5