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## Details of the Classical and Long-term Experiments 1968-73

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

#### Rothamsted Research

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## SAXMUNDHAM

### ROTATION II

(S/RN/2)

Third period, 1969 onwards

The study of the residues of superphosphate and FYM applied from 1899 to 1964 which commenced in 1965 was completed with the barley crop of 1968 (*Details 1967*, pp 56-57). Between 1969 and 1973 the effects of these residues and those of dressings of phosphate and FYM applied in the years 1965-67 were measured (no dressings were applied in 1968). Each treatment strip was divided into five plots and cropped in a rotation of potatoes, barley, sugar beet, barley, as shown below.

In 1973 a fresh experiment testing annual and triennial dressings of P fertiliser was started on plots growing sugar beet and potatoes, to be followed by two crops of barley; the same sequence on the other two plots commenced in 1974.

The cropping sequence was therefore:

	1968	1969	1970	1971	1972	1973
North block: North	B	P	B	SB	B	P
South	B	SB	B	P	B	SB
South block: North	B	B	P	B	SB	B
South	B	B	SB	B	P	B

B = barley, P = potatoes, SB = Sugar beet

#### Treatments

(a) Barley	1968-73	No P
(b) Sugar beet and potatoes	1969-72	Each plot was divided into five sub-plots in 1969 and P0, P1, P2, P3 was applied cumulatively (P0 to two sub-plots per plot)
	1973	P0, P1, P3 (P3 duplicated in each plot). P1 will be applied to the P1 sub-plot in each of the next two barley crops to equal the P3 dressing.

The plots were paired according to the P content of the soil in 1973 and the P treatments were allocated so as to balance the treatments up to 1967 and in the period 1969-72. (In 1974 the treatments were reversed as between crops.)

#### Potatoes 1973

Plot No.	1	2	3	8	4	6	5	7
Treatments 1899-1964	0	D	DP	DP52	DP	DP	DP	DP
Treatments 1965-67	0	D	0	0	D2	P1	D2P1	P2

*P to potatoes and beet 1969 and 1971*

	'A'		'B'			
P0	0	0	0	0		
P0	P1	P3	P3	P1		
P1	P3	P1	P1	P3	'A'	'B'
P2	P1	P3	P3	P1		
P3	P3	P1	P1	P3		
<i>Sugar beet 1973</i>		'B'	'A'		'B'	'A'

**Symbols**

1899-1964	D =	25 t FYM, 630 kg superphosphate (to 1920), 940 kg since 1921 applied every 4 years.
	DP52 =	25 t FYM, 1260 kg superphosphate (to 1920), 1880 kg superphosphate since 1921 applied every 4 years to 1951 when manuring stopped.
1965-67	D2 =	50 t FYM in 1966 and 1967; P1 = 82 kg P, P2 = 164 kg P annually.
1969-72	P1 =	27.4 kg P, P2 = 54.8 kg P, P3 = 82.2 kg P as super- phosphate to potatoes and sugar beet.

**Basal applications (kg)**

		N	K	Material
Barley:	1968	94	50	(25-0-16)
	1969 & 1970	125	67	(25-0-16)
	1971-73	100	53	(25-0-16)
Potatoes:	1969	250	210	(25-0-16) + muriate of potash
	1970	250	417	(25-0-16) + muriate of potash
	1971-73	250	448	(25-0-16) + muriate of potash
Sugar beet:	1969	190	314	(25-0-16) + muriate of potash
	1970	190	468	(25-0-16) + muriate of potash
	1971-73	190	415	(25-0-16) + muriate of potash

**Varieties**

Barley:	1968	Zephyr,
	1969	Sultan,
	1970-73	Julia (1973 dressed with ethirimol).
Potatoes:	1969-73	King Edward, once grown Rothamsted para- crinkle free seed, chitted.
Sugar beet:	1969-1973	Klein E

**Weedkillers**

Barley:	1968-71	Mecoprop with 2,4-D
	1972-73	Dichlorprop with MCPA
Potatoes:	1969	Linuron with paraquat
	1970	Linuron
	1971-73	Linuron with paraquat
Sugar beet:	1969-70	Pyrazone

**Other chemicals applied**

Fungicides	Barley	1972-73	Tridemorph
	Potatoes	1969	Fentin hydroxide

		1970	Captafol
		1971-73	Mancozeb
<b>Insecticides</b>	Potatoes	1969	Dimethoate
		1970-73	Menazon
	Sugar beet	1969	Dimeton-S-methyl and dimethoate
		1970	Menazon
		1971-72	DDT and menazon
	1973	Menazon	
<b>Area harvested</b>			
	Barley:	0.00050 to 0.0060	
	Potatoes:	0.00078	
	Sugar beet:	0.00100	

**Soil series.** Beccles series (slope phase) and Beccles series (deeper phase).

### Reference

1. Mattingley, G.E.G., Johnston, A.E. and Chater, Margaret (1970) The residual value of farmyard manure and superphosphate in the Saxmundham Rotation II Experiment 1899-1968. *Rothamsted Experimental Station. Report for 1969, Part 2, 91-112.*