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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

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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
Insecticides	Potatoes	1969	Dimethoate
		1970-73	Menazon
	Sugar beet	1969	Dimeton-S-methyl and dimethoate
		1970	Menazon
		1971-72	DDT and menazon
	1973	Menazon	
Area harvested			
	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.*