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Yields of the Field Experiments 1972

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72/W/CS/16 Irrigation and Eelworms - Potatoes

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72/W/CS/16

IRRIGATION AND EELWORMS

Object: To study the cumulative and residual effects of dazomet and the effects of irrigation on the yield and incidence of *Heterodera rostochiensis* on potatoes grown continuously. Susceptible and resistant varieties are studied, either grown continuously or alternated - Woburn Butt Close Series I and IV.

Sponsors: F.G.W. Jones, K. Evans, D.L. Trudgill.

The seventh year, potatoes.

For previous years see 66/C/32(t), 67/C/25, 68/C/19, 69/W/CS/16(t) and 70-71/W/CS/16.

Treatments: Series I: All combinations of:-

1. Whole plots: Irrigation: None (0), full irrigation 1966-72 (C).
2. Quarter plots: Residues of fumigants applied 1966-71: None (0), DD (1966-68), dazomet (1969-71) (F).
3. Strips of 4 plots; residues of sequences of varieties in successive years (PD = Pentland Dell, MP = Maris Piper): continuous PD, continuous MP, alternating PD/MP, alternating MP/PD.

NOTE: The sequences of varieties ended in 1971 on Series I. Pentland Crown was planted on all plots of this series in 1972. The treatments on Series IV continued as in 1971.

Irrigation to C plots 1972 (mm water) (Series I and IV):

8-9 June	12.7
16 June	12.7
22-23 June	12.7
28-29 June	12.7
11-12 July	12.7
18-19 July	12.7
21-24 July	12.7

Total	88.9
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Basal applications: 1510 kg (13:13:20). Weedkiller: Series I: Linuron at 1.1 kg with paraquat 0.42 kg ion in 370 l. Series IV: Linuron at 1.1 kg in 370 l. Fungicide: Mancozeb at 1.3 kg in 430 l. Fungicide with insecticide: Mancozeb at 1.3 kg with demeton-s-methyl at 0.25 kg in 430 l.

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Cultivations, etc.:-

Series I: Deep-tine cultivated: 13 Sept, 1971. Ploughed: 17 Dec.
NPK applied: 29 Mar, 1972. Rotary cultivated, potatoes planted:
6 Apr. Weedkiller applied: 5 May. Rotary ridged: 3 June.
Fungicide applied: 5 July. Fungicide with insecticide applied:
27 July. Haulm mechanically destroyed: 6 Sept. Lifted: 15 Sept.
Series IV: Deep-tine cultivated: 11 Sept, 1971. Dazomet applied,
all plots rotary cultivated: 15 Dec. Ploughed: 15 Feb, 1972.
NPK applied: 29 Mar. Rotary cultivated: 19 Apr. Potatoes planted:
20 Apr. Weedkiller applied: 8 May. Fungicide applied: 5 July.
Fungicide with insecticide applied: 26 July. Haulm mechanically
destroyed: 6 Sept. Lifted: 15 Sept.

- NOTES: (1) Soil samples were taken before planting and after lifting
for egg and cyst counts of *Heterodera rostochiensis* and
larval invasion tests.
(2) Weekly observations were made of water potential and stomatal
resistance of leaves and water content of the soil to a depth
of 60 cm on Series IV only.
(3) Plant samples were taken at three weekly intervals to measure
leaf areas, fresh and dry weights of haulm, fresh weights of
roots and new tubers and to determine percentage K in the
haulm.

Standard errors per plot. Total tubers, tonnes/hectare:

Series I:	Pooled whole and half plot:	4.74 or 18.8% (14 d.f.)
	Quarter plot:	3.09 or 12.2% (16 d.f.)
Series IV:	Pooled whole and half plot:	3.08 or 9.5% (14 d.f.)
	Quarter plot:	5.07 or 15.7% (16 d.f.)

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TABLES OF MEANS

SERIES I

VARIETY SEQUENCE (VS)

1966	MP	PD	PD	MP	
1967	MP	MP	PD	PD	
1968	MP	PD	PD	MP	
1969	MP	MP	PD	PD	
1970	MP	PD	PD	MP	
1971	MP	MP	PD	PD	
1972	PC	PC	PC	PC	Mean
TOTAL TUBERS: TONNES/HECTARE					
IRRIGATION (I)					
O	34.2	28.9	11.9	12.9	22.0
C	40.2	37.8	17.5	18.6	28.5
FUMIGANT					
1966-71 (F)					
O	33.7	28.7	16.7	16.8	24.0
F	40.7	38.0	12.8	14.7	26.6
Mean	37.2	33.4	14.7	15.7	25.3

STANDARD ERRORS OF DIFFERENCES

VS	F	VS I*	VS F
2.74	1.94	3.87	4.26
Unless same level of VS			2.74

* Within same level of I only

Varieties MP = Maris Piper
PD = Pentland Dell
PC = Pentland Crown

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SERIES I

VARIETY SEQUENCE (VS)

1966	MP	PD	PD	MP	
1967	MP	MP	PD	PD	
1968	MP	PD	PD	MP	
1969	MP	MP	PD	PD	
1970	MP	PD	PD	MP	
1971	MP	MP	PD	PD	
1972	PC	PC	PC	PC	Mean
PERCENTAGE WARE: 3.81 CM (1.5 INCH) RIDDLE					
IRRIGATION (I)					
O	86.9	86.9	80.9	74.5	82.3
C	93.0	92.5	84.8	83.1	88.3
FUMIGANT					
1966-71 (F)					
O	89.1	87.9	83.4	80.1	85.1
F	90.9	91.4	82.3	77.5	85.5
Mean	90.0	89.7	82.9	78.8	85.3

Varieties MP = Maris Piper
 PD = Pentland Dell
 PC = Pentland Crown

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SERIES IV

VARIETY SEQUENCE (VS)

1966	MP	MP	PD	PD	
1967	MP	PD	PD	MP	
1968	MP	MP	PD	PD	
1969	MP	PD	PD	MP	
1970	MP	MP	PD	PD	
1971	MP	PD	PD	MP	
1972	MP	MP	PD	PD	Mean
TOTAL TUBERS: TONNES/HECTARE					
IRRIGATION (I)					
O	34.1	30.5	17.6	33.2	28.9
C	43.5	37.8	22.7	38.5	35.6
FUMIGANT					
1966-72 (F)					
O	36.1	31.0	15.0	29.2	27.8
F	41.6	37.3	25.4	42.6	36.7
Mean	38.8	34.2	20.2	35.9	32.3

STANDARD ERRORS OF DIFFERENCES

VS	F	VS* I	VS F
1.78	1.26	2.51	3.86
Unless same level of VS			1.78

* Within same level of I only

Varieties MP = Maris Piper
PD = Pentland Dell

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SERIES IV

VARIETY SEQUENCE (VS)

1966	MP	MP	PD	PD	
1967	MP	PD	PD	MP	
1968	MP	MP	PD	PD	
1969	MP	MP	PD	PD	
1971	MP	PD	PD	MP	
1972	MP	MP	PD	PD	Mean

PERCENTAGE WARE: 3.81 CM (1.5 INCH) RIDDLE

IRRIGATION (I)

O	86.5	90.9	64.8	85.1	81.8
C	89.1	92.6	77.9	85.8	86.3

FUMIGANT
1966-72 (F)

O	85.1	93.7	65.9	79.8	81.1
F	90.5	89.8	76.8	91.1	87.0

Mean	87.8	91.8	71.3	85.4	84.1
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Varieties MP = Maris Piper
PD = Pentland Dell