ROTHAMSTED RESEARCH

Yields of the Field Experiments 1991

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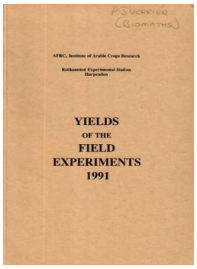

Potatoes

Rothamsted Research

Rothamsted Research (1992) *Potatoes ;* Yields Of The Field Experiments 1991, pp 169 - 178 **- DOI: https://doi.org/10.23637/ERADOC-1-46**

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POTATOES

CONTROL OF STORAGE DISEASES

Object: To study the effects of applying fungicides to seed tubers, harvest dates and post-harvest treatments on tuber diseases - Great Harpenden I.

Sponsors: S.M. Hall, G.A. Hide.

Design: 3 randomised blocks of 3 whole plots split into 9 sub plots.

Whole plot dimensions: 16.5 x 11.4.

Treatments: All combinations of:-

Whole plots

1. **HARVDATE** Dates of harvest:

H1	28 Aug, 1991
H2	18 Sept
H3	9 Oct

Sub plots

2. **FUNGRATE** Concentration of a mixture of thiabendazole (30%) and imazalil (10%) as a pre-planting dip:

0	None
F1	0.27% active ingredient of mixture
F2	0.07% active ingredient of mixture

NOTE: **HARVDATE** H1 and H2 haulm was pulverised 16 days before lifting and **HARVDATE** H3 was pulverised 14 days before lifting.

Basal applications: Manures: (0:20:32) at 980 kg. (12:20:20) at 1530 kg. Weedkillers: Linuron at 1.6 kg with paraquat at 0.60 kg ion in 200 l. Fungicides: Maneb at 0.96 kg and zinc oxide at 22 g in 200 l on three occasions, the first and third occasion with a wetting agent, 'Bond' at 0.2 l, and the second with the pirimicarb. Mancozeb at 1.4 kg with a wetting agent, 'Bond' at 0.2 l, in 200 l. Fentin hydroxide at 0.27 kg with a wetting agent, 'Nu Film P' at 0.18 l, in 200 l. Insecticide: Pirimicarb at 0.14 kg. Irrigation: 19 mm.

Variety: King Edward.

Cultivations, etc.:- PK applied: 4 Dec, 1990. Ploughed: 11 Dec. NPK applied: 11 Apr, 1991. Rotary harrowed, ridged: 15 Apr. Hand planted, split back: 16 Apr. Rotary ridged: 9 May. Weedkillers applied: 21 May. First maneb, zinc oxide and wetting agent applied: 1 July. Maneb, zinc oxide and pirimicarb applied: 10 July. Second maneb, zinc oxide and wetting agent applied: 19 July. Mancozeb with wetting agent applied: 1 Aug. Fentin hydroxide with wetting agent applied: 12 Aug. Irrigation applied: 14 Aug.

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NOTES: (1) Tuber diseases were assessed after harvest and in storage.
(2) Yields were not taken on **HARVDATE** H1.

TOTAL TUBERS TONNES/HECTARE

***** Tables of means *****

FUNGRATE	O	F1	F2	Mean
HARVDATE				
H2	44.0	45.3	46.7	45.4
H3	48.7	47.4	47.3	47.8
Mean	46.4	46.4	47.0	46.6

*** Standard errors of differences of means ***

FUNGRATE	**HARVDATE*** **FUNGRATE**
1.77	2.50

* Within the same level of **HARVDATE** only

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP.SP	44	5.31	11.4

PERCENTAGE WARE 4.44 CM (1.75 INCH) RIDDLE

***** Tables of means *****

FUNGRATE	O	F1	F2	Mean
HARVDATE				
H2	64.0	67.8	65.4	65.7
H3	68.6	70.8	61.7	67.0
Mean	66.3	69.3	63.6	66.4

SUB PLOT AREA HARVESTED 0.00171

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POTATOES

AUTUMN AND SPRING NEMATICIDES

Object: To study the effects of combinations of fumigant and non-fumigant nematicides on the control of Globodera pallida and on the yield of potatoes - Woburn, Far Field II.

Sponsors: A.G. Whitehead, A.J.F. Nichols.

Design: 2 whole plots each containing 2 replicates of 2 sub plots each containing 7 sub sub plots.

Whole plot dimensions: 15.0 x 54.0.

Treatments: All combinations of:-

Whole plots

1. **OXAMYL[90]** Oxamyl (kg) applied in April 1990:

   0.0
   5.6

Sub plots

2. **DICHLO[90]** 1, 3-dichloropropene (kg) applied 2 Nov, 1990:

   0 None (duplicated)
   300 300 (duplicated)

Sub sub plots

3. **OXAMYL[91]** Oxamyl (kg) applied 3 April, 1991:

   0.0 (duplicated for **VARIETY** DESIREE only)
   5.6

4. **VARIETY** Varieties:

   DESIREE
   RECORD
   ROMANO

Basal applications: Manures: (12:20:20) at 1.3 t. Weedkillers : Linuron at 1.5 kg with paraquat at 0.40 kg ion in 210 l. Fungicides: Maneb at 1.2 kg and zinc oxide at 28 g applied with a wetting agent, 'Bond' at 200 ml, in 200 l. Maneb at 0.96 kg and zinc oxide at 22 g with insecticide and wetting agent, 'Bond' at 200 ml, in 300 l. Maneb at 0.96 kg and zinc oxide at 22 g and wetting agent, 'Bond' at 200 ml, in 300 l. Mancozeb at 0.82 kg with insecticide and wetting agent, 'Bond' at 200 ml, in 300 l. Fentin hydroxide at 0.27 kg in 300 l. Insecticide: Pirimicarb at 0.14 kg applied on two occasions. Desiccant: Glufosinate-ammonium at 0.45 kg in 300 l.

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Cultivations, etc.:- Deep tine cultivated, fumigant treatment applied, rolled: 2 Nov, 1990. Rolled: 8 Nov. Heavy spring-tine cultivated: 12 Mar, 1991. Manures applied, spring-tine cultivated, nematicide treatments applied, rotary cultivated, tubers planted: 3 Apr. Rotary ridged, weedkiller applied: 26 Apr. Maneb, zinc oxide and wetting agent applied: 4 July. Maneb, zinc oxide, insecticide and wetting agent applied: 20 July. Maneb, zinc oxide and wetting agent applied: 31 July. Mancozeb, insecticide and wetting agent applied: 12 Aug. Fentin hydroxide applied: 27 Aug. Desiccant applied: 12 Sept. Potatoes lifted: 23 Sept. Previous crops: Navy beans 1989, potatoes 1990.

NOTE: Soil samples were taken before planting, after fumigation and after harvest for nematode counts and assessment of egg viability.

TOTAL TUBERS TONNES/HECTARE

***** Tables of means *****

DICHLO[90]	0	300	Mean
OXAMYL[90]			
0.0	22.1	41.3	31.7
5.6	31.1	43.8	37.5
Mean	26.6	42.6	34.6

OXAMYL[91]	0.0	5.6	Mean
OXAMYL[90]			
0.0	28.4	36.1	31.7
5.6	32.4	44.2	37.5
Mean	30.4	40.1	34.6

OXAMYL[91]	0.0	5.6	Mean
DICHLO[90]			
0	20.5	34.7	26.6
300	40.3	45.6	42.6
Mean	30.4	40.1	34.6

VARIETY	DESIREE	RECORD	ROMANO	Mean
OXAMYL[90]				
0.0	30.9	32.2	32.3	31.7
5.6	35.9	36.8	40.6	37.5
Mean	33.4	34.5	36.4	34.6

VARIETY	DESIREE	RECORD	ROMANO	Mean
DICHLO[90]				
0	25.9	27.5	26.6	26.6
300	40.8	41.5	46.2	42.6
Mean	33.4	34.5	36.4	34.6

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TOTAL TUBERS TONNES/HECTARE

***** Tables of means *****

VARIETY	DESIREE	RECORD	ROMANO	Mean
OXAMYL[91]				
0.0	30.7	31.1	29.2	30.4
5.6	38.8	38.0	43.6	40.1
Mean	33.4	34.5	36.4	34.6

	OXAMYL[91]	0.0	5.6
OXAMYL[90]	**DICHLO[90]**		
0.0	0	16.7	29.2
	300	40.1	42.9
5.6	0	24.4	40.1
	300	40.5	48.3

	VARIETY	DESIREE	RECORD	ROMANO
OXAMYL[90]	**DICHLO[90]**			
0.0	0	22.0	23.9	20.3
	300	39.8	40.6	44.3
5.6	0	29.9	31.2	33.0
	300	41.9	42.5	48.1

	VARIETY	DESIREE	RECORD	ROMANO
OXAMYL[90]	**OXAMYL[91]**			
0.0	0.0	27.9	30.1	27.6
	5.6	36.8	34.4	37.0
5.6	0.0	33.4	32.1	30.9
	5.6	40.7	41.6	50.2

	VARIETY	DESIREE	RECORD	ROMANO
DICHLO[90]	**OXAMYL[91]**			
0	0.0	21.3	21.5	18.0
	5.6	35.1	33.6	35.3
300	0.0	40.0	40.6	40.5
	5.6	42.5	42.4	51.9

		VARIETY	DESIREE	RECORD	ROMANO
OXAMYL[90]	**DICHLO[90]**	**OXAMYL[91]**			
0.0	0	0.0	17.1	18.4	14.3
		5.6	31.9	29.4	26.3
	300	0.0	38.7	41.8	40.9
		5.6	41.8	39.3	47.7
5.6	0	0.0	25.6	24.7	21.6
		5.6	38.3	37.7	44.3
	300	0.0	41.2	39.4	40.1
		5.6	43.2	45.5	56.2

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TOTAL TUBERS TONNES/HECTARE

*** Standard errors of differences of means ***

	DICHLO[90]	OXAMYL[91]	VARIETY	OXAMYL[90]* DICHLO[90]	
			1.41		min.rep
	2.35	1.08	1.29	3.33	max-min

	OXAMYL[90]* OXAMYL[91]	OXAMYL[90]* VARIETY	DICHLO[90] OXAMYL[91]	DICHLO[90] VARIETY	
		2.00	2.65	2.89	min.rep
	1.53	1.82	2.59	2.78	max-min
			2.53	2.65	max.rep
Except when comparing means with the same level(s) of					
DICHLO[90]				2.00	min.rep
			1.53	1.82	max-min

	OXAMYL[91] VARIETY	OXAMYL[90]* DICHLO[90] OXAMYL[91]	OXAMYL[90]* DICHLO[90] VARIETY	DICHLO[90] OXAMYL[91] VARIETY	
	2.00	3.75	4.09	3.52	min.rep
	1.73	3.66	3.93	3.22	max-min
		3.57	3.75	2.89	max.rep
Except when comparing means with the same level(s) of					
DICHLO[90]				2.82	min.rep
				2.45	max-min
OXAMYL[90].DICHLO[90]		2.31	2.82		min.rep
		2.16	2.58		max-min
		2.00	2.31		max.rep

	OXAMYL[90]* OXAMYL[91] VARIETY	OXAMYL[90]* DICHLO[90] OXAMYL[91] VARIETY	
	2.82	4.97	min.rep
	2.45	4.55	max-min
		4.09	max.rep
Except when comparing means with the same level(s) of			
OXAMYL[90].DICHLO[90]		3.99	min.rep
		3.46	max-min
		2.82	max.rep

* Within the same level of **OXAMYL[90]** or **DICHLO[90]**

max.rep **OXAMYL[91]** 0.0 and **VARIETY** DESIREE
min.rep all treatments except **OXAMYL[91]** 0.0 and **VARIETY** DESIREE
max-min **OXAMYL[91]** 0.0 and **VARIETY** DESIREE v all other combinations

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
WP.SP	4	3.33	9.6
WP.SP.SSP	28	3.99	11.6

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PERCENTAGE WARE 3.8CM (1.5 INCH) RIDDLE

***** Tables of means *****

DICHLO[90]	0	300	Mean
OXAMYL[90]			
0.0	63.3	83.2	73.3
5.6	75.9	84.1	80.0
Mean	69.6	83.7	76.6

OXAMYL[91]	0.0	5.6	Mean
OXAMYL[90]			
0.0	69.8	77.9	73.3
5.6	77.6	83.2	80.0
Mean	73.7	80.5	76.6

OXAMYL[91]	0.0	5.6	Mean
DICHLO[90]			
0	63.9	77.2	69.6
300	83.5	83.9	83.7
Mean	73.7	80.5	76.6

VARIETY	DESIREE	RECORD	ROMANO	Mean
OXAMYL[90]				
0.0	71.0	71.5	78.5	73.3
5.6	77.9	81.0	82.2	80.0
Mean	74.4	76.2	80.3	76.6

VARIETY	DESIREE	RECORD	ROMANO	Mean
DICHLO[90]				
0	65.9	71.6	73.1	69.6
300	82.9	80.8	87.6	83.7
Mean	74.4	76.2	80.3	76.6

VARIETY	DESIREE	RECORD	ROMANO	Mean
OXAMYL[91]				
0.0	72.8	74.1	75.1	73.7
5.6	77.7	78.4	85.6	80.5
Mean	74.4	76.2	80.3	76.6

	OXAMYL[91]	0.0	5.6
OXAMYL[90]	**DICHLO[90]**		
0.0	0	56.3	72.7
	300	83.3	83.2
5.6	0	71.5	81.7
	300	83.7	84.6

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PERCENTAGE WARE 3.8CM (1.5 INCH) RIDDLE

***** Tables of means *****

	VARIETY	DESIREE	RECORD	ROMANO
OXAMYL[90]	DICHLO[90]			
0.0	0	58.6	64.9	68.8
	300	83.4	78.1	88.1
5.6	0	73.3	78.3	77.4
	300	82.5	83.6	87.0

	VARIETY	DESIREE	RECORD	ROMANO
OXAMYL[90]	OXAMYL[91]			
0.0	0.0	68.8	69.2	72.4
	5.6	75.4	73.9	84.5
5.6	0.0	76.8	79.0	77.7
	5.6	80.0	82.9	86.6

	VARIETY	DESIREE	RECORD	ROMANO
DICHLO[90]	OXAMYL[91]			
0	0.0	61.4	67.7	65.1
	5.6	74.9	75.6	81.1
300	0.0	84.2	80.5	85.1
	5.6	80.5	81.2	90.0

		VARIETY	DESIREE	RECORD	ROMANO
OXAMYL[90]	DICHLO[90]	OXAMYL[91]			
0.0	0	0.0	53.3	60.8	57.6
		5.6	69.0	69.1	80.0
	300	0.0	84.2	77.5	87.2
		5.6	81.8	78.6	89.1
5.6	0	0.0	69.5	74.6	72.6
		5.6	80.8	82.1	82.2
	300	0.0	84.2	83.5	82.9
		5.6	79.2	83.7	91.0

SUB PLOT AREA HARVESTED 0.00090

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91/W/P/2

POTATOES

DOUBLE CROPPING

Object: To study the effects of growing two crops of potatoes in one season on the increase of Globodera pallida - Woburn, Lansome/Mill Dam Close III.

Sponsor: A.G. Whitehead.

Design: 2 randomised blocks of 8 plots.

Whole plot dimensions: 3.0 x 6.0.

Treatments: All combinations of:-

1. **JAV OX** Rates of oxamyl (kg) applied to the seedbed for first early Pentland Javelin grown under plastic sheet: 11 Mar, 1991.

   0.0
   2.8
   5.6

2. **COS OX** Rates of oxamyl (kg) applied to the seedbed for Costella grown after the Pentland Javelin: 5 July.

   0.0
   5.6

plus two extra treatments, rates of oxamyl (kg) applied to the seedbed for Costella grown as a single maincrop variety: 5 Apr.

M COS OX

0.0
5.6

Basal applications: Manures: (0:24:24) at 1.3 t.

Standard applications:

JAV OX plots only: Manures: 'Nitro-Chalk' at 670 kg. Weedkiller: Linuron at 1.6 kg in 250 l. Irrigation: 12 mm applied on four occasions and 6.5 mm on the fifth.

COS OX plots only: Manures: (13:13:21) at 1.8 t. Weedkiller: Linuron at 1.5 kg in 200 l. Fungicides: Mancozeb at 0.82 kg and wetting agent, 'Bond' at 200 ml, applied on three occasions, with insecticide on the first and third, all in 300 l. Fentin hydroxide at 0.27 kg in 300 l. Insecticide: Pirimicarb at 0.14 kg on two occasions. Irrigation: 12 mm applied on five occasions.

M COS OX plots only: Manures: 'Nitro-Chalk' at 820 kg. Weedkillers: Monolinuron at 0.77 kg and paraquat at 0.55 kg ion in 200 l. Fungicides: Mancozeb at 0.82 kg and wetting agent, 'Bond' at 200 ml, applied on three occasions, with insecticide on the first and third, all in 300 l. Insecticide: Pirimicarb at 0.14 kg on two occasions. Irrigation: 12 mm applied on four occasions and 6.5 mm on the fifth.

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Cultivations, etc.:-
All plots: P and K applied: 5 Mar, 1991. Spring-tine cultivated, rotary cultivated: 11 Mar.
JAV OX plots only: N applied: 5 Mar. Oxamyl treatments applied, potatoes planted, weedkiller applied: 11 Mar. Plastic sheet applied: 12 Mar. Plastic sheet removed: 20 May. Irrigated: 21, 29, 31 May, 3 and 7 June. Potatoes lifted: 19 June.
COS OX plots only: Rolled: 20 June. Rotary cultivated, oxamyl treatments applied, manures applied, rotary cultivated, potatoes planted: 5 July. Rotary ridged: 8 July. Weedkiller applied: 10 July. Mancozeb, pirimicarb and wetting agent applied: 20 July and 12 Aug. Mancozeb and wetting agent applied: 31 July. Irrigation applied: 15, 28 Aug, 7, 14 and 21 Sept. Fentin hydroxide applied: 12 Sept. Potatoes lifted: 29 Oct.
M COS OX plots only: Rotary cultivated, N applied, oxamyl treatments applied, spiked rotary cultivated, potatoes planted: 5 Apr. Weedkillers applied: 1 May. Irrigated: 21, 29, 31 May, 3 and 7 June. Mancozeb, pirimicarb and wetting agent applied: 20 July and 12 Aug. Mancozeb and wetting agent applied: 31 July. Potatoes lifted: 13 Aug. Previous crops: Potatoes since 1988.

NOTE: Soil samples were taken before planting and after each crop for nematode counts.

TOTAL TUBERS TONNES/HECTARE

***** Tables of means *****

COS OX	0.0	5.6	Mean
JAV OX			
0.0	28.3	40.3	34.3
2.8	33.2	45.5	39.4
5.6	33.0	32.5	32.7
Mean	31.5	39.4	35.5

M COS OX	0.0	5.6	Mean
	4.5	20.8	12.6

GRAND MEAN 29.8

*** Standard errors of differences of means ***

JAV OX	**COS OX**	**JAV OX COS OX & M COS OX**
2.99	2.45	4.24

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	7	4.24	14.2

PLOT AREA HARVESTED 0.00090

https://doi.org/10.23637/ERADOC-1-46