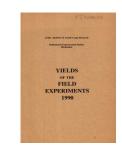
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Yields of the Field Experiments 1990



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Potatoes

Rothamsted Research

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90/R/P/1 and 90/W/P/1

POTATOES

FUNGICIDES WITH THE SEED

Object: To study the effects of fungicides applied with the seed at planting on the yield and tuber diseases of potatoes - Rothamsted, Fosters West (R), Woburn, Butt Furlong (W).

Sponsors: R. Moffitt, G.A. Hide.

Design: 2 randomised blocks of 18 plots.

Whole plot dimensions: 1.5×6.0 .

Treatments: All combinations of:-

VARIETY Varieties:

DESIREE ESTIMA MARFONA

2. SOILFUNG Fungicides, per t of seed, applied in the ridge at

planting:

THIA+IMA Thiabendazole at 30 g plus imazalil at 10 g

TOLC MET Tolclofos methyl at 250 g

3. FUNGMETH Methods of applying fungicides:

PLANTING At planting

SEEDRESS As a seed application prior to planting

plus three extra treatments:

EXTRA

DES NONE	Desiree not given fungicides to the seed (duplicated)
EST NONE	Estima not given fungicides to the seed (duplicated)
MAR NONE	Marfona not given fungicides to the seed (duplicated)

NOTES: (1) SOILFUNG applications were made with a powder applicator placing the fungicide alongside the potatoes at planting.

(2) SEEDRESS treatments were applied to tubers by electrostatic sprayer in 0.44 l of water per tonne of seed on 21 Feb, 1990 to Estima and Desiree, 9 Mar to Marfona.

Basal applications:

Fosters West (R): Manures: FYM at 41 t. (13:13:21) at 1.5 t.

Weedkillers: Glyphosate at 1.4 kg in 200 l. Linuron at 1.6 kg in 200 l. Fungicides: Maneb at 0.96 kg and zinc oxide at 0.022 kg in 200 l applied on two occasions, with the insecticide on the first and with a wetting agent, 'Bond' at 200 ml, on the second.

Mancozeb at 1.0 kg in 200 l applied on two occasions. Fentin hydroxide at 0.27 kg in 200 l. Insecticide: Pirimicarb at 0.14 kg. Irrigation: 25 mm applied on each of four occasions.

Desiccant: BOV at 280 l.

90/R/P/1 and 90/W/P/1

Basal applications:

Butt Furlong (W): Manures: (0:18:36) at 690 kg. (13:13:20) at 1.6 t. Weedkiller: Linuron at 1.6 kg in 220 l. Fungicide: Mancozeb at 1.0 kg with a wetting agent, 'Bond' at 200 ml, in 220 l, applied on two occasions. Mancozeb at 1.4 kg, with 'Bond' at 200 ml, in 220 l. Fentin hydroxide at 0.27 kg applied on three occasions in 220 l. Nematicide: Oxamyl at 5.5 kg. Irrigation: 12 mm applied on each of ten occasions. Desiccant: BOV at 220 l.

Cultivations, etc.:-

Fosters West (R): Glyphosate applied: 26 Sept, 1989. FYM applied: 15 Nov. Ploughed: 23 Nov. NPK applied: 19 Mar, 1990. Springtine cultivated, rotary harrowed, potatoes planted and rotary ridged: 4 Apr. Linuron applied: 5 Apr. Irrigation applied: 6, 26 June, 16 July and 1 Aug. Maneb, zinc oxide and pirimicarb applied: 15 June. Mancozeb applied: 29 June and 13 July. Maneb, zinc oxide and wetting agent applied: 27 July. Fentin hydroxide applied: 13 Aug. Haulm mechanically destroyed: 23 Aug. Desiccant applied: 28 Aug. Potatoes lifted: 24 Oct. Previous crops: S. wheat 1988, w. oats 1989.

Butt Furlong (W): PK applied: 2 Sept, 1989. Subsoiled with times 150 cm apart and 45 cm deep: 11 Sept. Ploughed: 16 Nov. Nematicide applied, NPK applied, spring-time cultivated and seed planted: 11 Apr, 1990. Weedkiller applied: 19 Apr. Mancozeb at lower rate with wetting agent applied: 26 June and 11 July and at higher rate: 24 July. Irrigation applied: 27, 29 June, 2, 11, 17, 20, 23 July, 3, 6 and 10 Aug. Fentin hydroxide applied: 7, 21 Aug and 10 Sept. Haulm mechanically destroyed: 12 Sept. Desiccant applied: 17 Sept. Potatoes lifted: 19 Oct. Previous crops: S. barley 1988 and 1989.

NOTE: Tuber diseases were assessed after harvest.

90/R/P/1 FOSTERS WEST (R)

TOTAL TUBERS TONNES/HECTARE

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

SOILFUNG	THIA+IMA	TOLC MET	Mean	
VARIETY	INIATINA	TOLC PET	rican	
and the second second second	40.1	41.9	41.0	
DESIREE			100	
ESTIMA		and the second s	43.6	
MARFONA	44.0	48.7	46.4	
Mean	42.7	44.6	43.7	
FUNGMETH	PLANTING	SEEDRESS	Mean	
VARIETY				
DESIREE	41.2	40.9	41.0	
ESTIMA	42.8	44.4	43.6	
MARFONA	47.8	44.9	46.4	
Mean	43.9	43.4	43.7	
FUNGMETH	PLANTING	SEEDRESS	Mean	
SOILFUNG				
THIA+IMA	42.4	43.0	42.7	
TOLC MET	45.4	43.8	44.6	
Mean	43.9	43.4	43.7	
			W	

	SOILFUNG	THIA+IMA		TOLC MET	
VARIETY	FUNGMETH	PLANTING	SEEDRESS	PLANTING	SEEDRESS
DESIREE		38.9	41.4	43.5	40.3
ESTIMA		42.4	45.6	43.2	43.1
MARFONA		45.9	42.1	49.7	47.8

EXTRA DES NONE EST NONE MAR NONE Mean 45.2 46.5 45.8 45.8

GRAND MEAN 44.4

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

VARIETY	SOILFUNG	FUNGMETH	VARIETY SOILFUNG
2.51	2.05	2.05	3.55
VARIETY FUNGMETH	SOILFUNG FUNGMETH	VARIETY SOILFUNG FUNGMETH	EXTRA
3.55	2.90	5.02	3.55

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

Stratum	d.f.	s.e.	cv%	
BLOCK.WP	20	5.02	11.3	

90/R/P/1 FOSTERS WEST (R)

PERCENTAGE WARE 3.81CM (1.5 INCH) RIDDLE

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

SOILFUNG	THIA+IMA	TOLC MET	Mean
VARIETY			
DESIREE	95.5	96.1	95.8
ESTIMA	94.8	96.2	95.5
MARFONA	97.7	97.5	97.6
Mean	96.0	96.6	96.3
FUNGMETH	PLANTING	SEEDRESS	Mean
VARIETY			
DESIREE	96.0	95.6	95.8
ESTIMA	95.2	95.7	95.5
MARFONA	97.5	97.7	97.6
Mean	96.2	96.4	96.3
FUNGMETH	PLANTING	SEEDRESS	Mean
SOILFUNG			
THIA+IMA	95.7	96.4	96.0
TOLC MET	96.8	96.4	96.6
Mean	96.2	96.4	96.3

	SOILFUNG	THIA+IMA		TOLC MET	
VARIETY	FUNGMETH	PLANTING	SEEDRESS	PLANTING	SEEDRESS
DESIREE		95.4	95.7	96.6	95.6
ESTIMA		94.0	95.6	96.5	95.9
MARFONA		97.7	97.8	97.3	97.7

EXTRA DES NONE EST NONE MAR NONE Mean 96.0 96.9 96.4 96.4

GRAND MEAN 96.3

90/W/P/1 BUTT FURLONG (W)

TOTAL TUBERS TONNES/HECTARE

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

SOILFUNG	THIA+IMA	TOLC MET	Mean
VARIETY			
DESIREE	59.5	54.7	57.1
ESTIMA	55.7	49.3	52.5
MARFONA	75.8	61.1	68.5
Mean	63.7	55.0	59.4
FUNGMETH	PLANTING	SEEDRESS	Mean
VARIETY			
DESIREE	60.2	54.0	57.1
ESTIMA	50.1	54.9	52.5
MARFONA	67.1	69.8	68.5
Mean	59.1	59.6	59.4
FUNGMETH	PLANTING	SEEDRESS	Mean
SOILFUNG			
THIA+IMA	62.8	64.6	63.7
TOLC MET	55.5	54.6	55.0
Mean	59.1	59.6	59.4

	SOILFUNG	THIA+IMA		TOLC MET	
VARIETY	FUNGMETH	PLANTING	SEEDRESS	PLANTING	SEEDRESS
DESIREE		61.8	57.2	58.6	50.8
ESTIMA		46.9	64.5	53.2	45.4
MARFONA		79.6	72.1	54.7	67.6

EXTRA DES NONE EST NONE MAR NONE Mean 62.1 58.6 68.2 63.0

GRAND MEAN 60.6

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

VARIETY	SOILFUNG	FUNGMETH	VARIETY SOILFUNG
4.68	3.82	3.82	6.62
VARIETY FUNGMETH	SOILFUNG FUNGMETH	VARIETY SOILFUNG FUNGMETH	EXTRA
6.62	5.41	9.36	6.62

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

Stratum d.f. s.e. cv% BLOCK.WP 20 9.36 15.5

90/W/P/1 BUTT FURLONG (W)

PERCENTAGE WARE 3.81CM (1.5 INCH) RIDDLE

**** Tables of means ****

SOILFUNG	THIA+IMA	TOLC MET	Mean
VARIETY			
DESIREE	90.0	88.4	89.2
ESTIMA	91.0	93.5	92.2
MARFONA	94.4	93.1	93.7
Mean	91.8	91.7	91.7
FUNGMETH	PLANTING	SEEDRESS	Mean
VARIETY			
DESIREE	90.1	88.2	89.2
ESTIMA	90.8	93.7	92.2
MARFONA	93.8	93.7	93.7
Mean	91.6	91.9	91.7
FUNGMETH	PLANTING	SEEDRESS	Mean
SOILFUNG			
THIA+IMA	91.1	92.4	91.8
TOLC MET	92.0	91.3	91.7
Mean	91.6	91.9	91.7

	SOILFUNG	THIA+IMA		TOLC MET	
VARIETY	FUNGMETH	PLANTING	SEEDRESS	PLANTING	SEEDRESS
DESIREE		90.1	89.8	90.0	86.7
ESTIMA		88.8	93.2	92.7	94.2
MARFONA		94.4	94.3	93.1	93.1

EXTRA DES NONE EST NONE MAR NONE Mean 89.8 91.4 94.7 92.0

GRAND MEAN 91.8

POTATOES

CHEMICAL CONTROL OF GLOBODERA PALLIDA

Object: To determine whether yield and control of G. pallida are increased by adding to oxamyl chemicals with different effects on the nematodes - Woburn, Lansome/Mill Dam Close III.

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

Design: 3 randomised blocks of 2 plots split into 6 sub plots.

Whole plot dimensions: 6.0 x 13.3.

Treatments: All combinations of:-

IRRIGATN Irrigation:

NONE None

FULL Full, to reduce a soil moisture deficit of 37 mm to

25 mm

Sub plots

CHEMICAL Chemicals:

NONE None

OXAMYL Oxamyl at 5.6 kg

OX CARBO Oxamyl at 5.6 kg + carbofuran at 5.6 kg

OX ETHOP Oxamyl at 5.6 kg + ethoprophos at 5.6 kg

OX FORMA Oxamyl at 5.6 kg + formalin at 1170 kg in 3000 l

OX SODME Oxamyl at 5.6 kg + sodium metavanadate at 36 kg

NOTES: (1) Irrigation was applied on 21 occasions; at 12 mm on each.

(2) Formalin was applied on 13 Feb, 1990, the other chemicals on 23 Apr.

Basal applications: Manures: (13:13:20) at 1.6 t. Weedkillers:
 Glyphosate at 1.4 kg in 220 l. Linuron at 1.6 kg in 220 l.
 Fungicides: Mancozeb at 1.0 kg on the first two occasions and at
 1.4 kg on the third, applied with a wetting agent, 'Bond' at 200 ml,
 in 220 l. Fentin hydroxide at 0.27 kg in 220 l, applied on three
 occasions.

Variety: Desiree.

Cultivations, etc.:- Glyphosate applied: 1 Sept, 1989. Ploughed:
13 Nov. NPK applied: 20 Apr, 1990. Rotary cultivated, potatoes
planted: 23 Apr. Rotary ridged: 26 Apr. Linuron applied: 3 May.
Irrigation treatment applied: 9, 15, 18, 22, 31 May, 5, 8, 13, 15,
19, 26, 29 June, 2, 11, 16, 20, 23, 26 July, 3, 6 and 10 Aug.
Mancozeb and wetting agent applied: 26 June, 11 and 24 July. Fentin
hydroxide applied: 7, 10 Aug and 10 Sept. Haulm mechanically
destroyed: 14 Sept. Potatoes lifted: 19 Sept. Previous crops:
Potatoes 1988, s. barley 1989.

NOTE: Populations of G. pallida eggs in soil were assessed before planting and after harvest.

TOTAL TUBERS TONNES/HECTARE

**** Tables of means ****

IRRIGATN	NONE	FULL	Mean
CHEMICAL			STATE OF THE STATE
NONE	18.6	34.1	26.4
OXAMYL	22.5	44.2	33.3
OX CARBO	22.6	39.3	30.9
OX ETHOP	21.0	43.8	32.4
OX FORMA	23.0	43.5	33.2
OX SODME	20.5	36.0	28.3
Mean	21.4	40.1	30.8

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

CHEMICAL	IRRIGATN'
	CHEMICAL
3.27	4 63

* Within the same level of IRRIGATN only

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

Stratum	d.f.	s.e.	cva
BLOCK.WP.SP	20	5.67	18.4

PERCENTAGE WARE 4.4CM (1.75 INCH) RIDDLE

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

IRRIGATN	NONE	FULL	Mean
CHEMICAL		1022	110411
NONE	80.7	87.9	84.3
OXAMYL	84.9	90.6	87.8
OX CARBO	86.4	88.3	87.4
OX ETHOP	82.7	89.2	85.9
OX FORMA	79.8	89.2	84.5
OX SODME	85.9	89.0	87.5
Mean	83.4	89.1	86.2

POTATOES

RESISTANT VARIETIES AND PCN CONTROL

Object: To assess yields of, and control of a mixed population of Globodera rostochiensis and G. pallida by, six varieties of potato differing in heir susceptibilities to the potato cyst nematodes (PCN) - Woburn, Lansome/Mill Dam Close III.

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

Design: 2 randomised blocks of 2 plots split into 12 sub plots.

Whole plot dimensions: 6.0 x 27.4.

Treatments: All combinations of:-

Whole plots

IRRIGATN Irrigation:

NONE None

FULL Full, to reduce a soil moisture deficit of 37 mm to

25 mm

Sub plots

2. VARIETY Varieties:

DESIREE MORAG NADINE ROCKET SANTE STROMA

3. NEMACIDE Nematicide:

NONE No.

OXAMYL Oxamyl at 5.6 kg applied to the seedbed

NOTE: Irrigation was applied on 20 occasions; at 25 mm on the second occasion, at 12 mm on the rest.

Basal applications: Manures: (13:13:20) at 1.6 t. Weedkillers: Glyphosate at 1.4 kg in 220 l. Linuron at 1.6 kg in 220 l. Fungicides: Mancozeb at 1.0 kg on the first two occasions and at 1.4 kg on the third applied with a wetting agent, 'Bond' at 200 ml, in 220 l. Fentin hydroxide at 0.27 kg in 220 l, applied on three occasions.

Cultivations, etc.:- Glyphosate applied: 1 Sept, 1989. Ploughed:
13 Nov. NPK applied: 20 Apr, 1990. Spring-tine cultivated: 23 Apr.
Nematicide treatment applied, rotary cultivated and potatoes planted:
24 Apr. Rotary ridged: 26 Apr. Linuron applied: 3 May. Irrigation
treatment applied: 15, 18, 22, 31 May, 5, 8, 13, 15, 19, 26, 29 June,
2, 11, 16, 20, 23, 26 July, 3, 6 and 10 Aug. Mancozeb and wetting
agent applied: 26 June, 11 and 24 July. Fentin hydroxide applied: 7,
21 Aug and 10 Sept. Haulm mechanically destroyed: 14 Sept. Potatoes
lifted: 19 Sept. Previous crops: Potatoes 1988 and 1989.

NOTE: Populations of G. pallida eggs in soil were assessed before planting and after harvest.

TOTAL TUBERS TONNES/HECTARE

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

.9
.8
.8
.5
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3.4
2.5
an
3.1
1.8
2.5
2 2 3 1 2 1

TOTAL TUBERS TONNES/HECTARE

**** Tables of means ****

	NEMACIDE	NONE	OXAMYL
VARIETY	IRRIGATN		
DESIREE	NONE	12.8	16.5
	FULL	24.9	25.4
MORAG	NONE	12.9	14.8
*	FULL	27.6	53.7
NADINE	NONE	9.2	11.6
	FULL	20.1	46.3
ROCKET	NONE	11.4	15.2
	FULL	35.3	36.2
SANTE	NONE	10.1	11.9
	FULL	19.7	30.1
STROMA	NONE	12.8	18.2
	FULL	32.4	30.2

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

VARIETY	NEMACIDE	IRRIGATN* VARIETY
3.74	2.16	5.29
IRRIGATN*	VARIETY	IRRIGATN*
NEMACIDE	NEMACIDE	VARIETY
		NEMACIDE
3.05	5.29	7.48

^{*} Within the same level of IRRIGATN only

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

Stratum	d.f.	s.e.	CV%
BLOCK.WP.SP	22	7.48	33.3

90/W/P/3

PERCENTAGE WARE 4.4CM (1.75 INCH) RIDDLE

**** Tables of means ****

IRRIGATN	NONE	FULL	Mean
VARIETY			
DESIREE	67.2	80.0	73.6
MORAG	70.6	83.1	76.8
NADINE	71.1	75.2	73.2
ROCKET	76.6	86.7	81.6
SANTE	71.8	78.1	75.0
STROMA	74.1	81.4	77.7
Mean	71.9	80.7	76.3
NEMACIDE	NONE	OXAMYL	Mean
VARIETY			
DESIREE	74.2	72.9	73.6
MORAG	72.3	81.3	76.8
NADINE	68.9	77.4	73.2
ROCKET	79.4	83.9	81.6
SANTE	73.1	76.8	75.0
STROMA	75.6	79.8	77.7
Mean	73.9	78.7	76.3
NEMACIDE	NONE	OXAMYL	Mean
IRRIGATN			
NONE	69.1	74.7	71.9
FULL	78.7	82.8	80.7
Mean	73.9	78.7	76.3
VARIETY	NEMACIDE IRRIGATN	NONE	OXAMYL
DESIREE	NONE	65.7	68.7
	FULL	82.8	77.2
MORAG	NONE	67.6	73.5
	FULL	77.1	89.1
NADINE	NONE	69.6	72.6
	FULL	68.2	82.3
ROCKET	NONE	71.9	81.2
	FULL	86.8	86.6
SANTE	NONE	72.3	71.4
	FULL	73.9	82.3
STROMA	NONE	67.6	80.5
	FULL	83.6	79.2

POTATOES

SUSCEPTIBLE VARIETIES AND G. PALLIDA CONTROL

Object: To assess the control of Globodera pallida by oxamyl on a range of susceptible varieties - Woburn, Lansome/Mill Dam Close III.

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

Design: 2 randomised blocks of 22 plots.

Whole plot dimensions: 3.0 x 4.6.

Treatments: All combinations of:-

VARIETY Varieties:

BARD Maris Bard
CARA Cara
COSTELLA Costella
DESIREE Desiree
ESTIMA Estima

JAVELIN Pentland Javelin
PIPER Maris Piper

RECORD Record
ROMANO Romano

SQUIRE Pentland Squire

WILJA Wilja

2. NEMACIDE Nematicide:

NONE None

OXAMYL Oxamyl at 5.6 kg applied to the seedbed

Basal applications: Manures: (13:13:20) at 1.6 t. Weedkillers: Glyphosate at 1.4 kg in 220 l. Linuron at 1.6 kg in 220 l. Fungicides: Mancozeb at 1.0 kg on the first two occasions and at 1.4 kg on the third, applied with a wetting agent, 'Bond' at 200 ml, in 220 l. Fentin hydroxide at 0.27 kg in 220 l, applied on three occasions. Irrigation: 12 mm applied on each of 17 occasions.

Cultivations, etc.:- Glyphosate applied: 1 Sept, 1989. Ploughed:
13 Nov. NPK applied: 20 Apr, 1990. Spring-tine cultivated: 23 Apr.
Oxamyl treatments applied, rotary cultivated, potatoes planted:
25 Apr. Rotary ridged: 26 Apr. Linuron applied: 3 May. Irrigation
applied: 15, 18, 22, 31 May, 5, 8, 13, 15, 19, 26, 29 June, 2, 11,
16, 20, 23 and 26 July. Mancozeb and wetting agent applied: 26 June,
11 and 24 July. Fentin hydroxide applied: 7, 21 Aug and 10 Sept.
Haulm mechanically destroyed: 14 Sept. Potatoes lifted: 18 Sept.
Previous crops: Potatoes 1988, s. barley 1989.

NOTE: Populations of G. pallida eggs in soil were assessed before planting and after harvest.

TOTAL TUBERS TONNES/HECTARE

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

NEMACIDE	NONE	OXAMYL	Mean
VARIETY			
BARD	27.6	33.5	30.5
CARA	33.2	43.2	38.2
COSTELLA	43.5	58.0	50.7
DESIREE	27.6	43.4	35.5
ESTIMA	35.1	49.4	42.2
JAVELIN	28.4	31.8	30.1
PIPER	43.3	49.9	46.6
RECORD	23.5	28.1	25.8
ROMANO	36.3	33.2	34.7
SQUIRE	40.4	44.5	42.4
WILJA	35.4	36.3	35.8
Mean	34.0	41.0	37.5

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

VARIETY	NEMACIDE	VARIE:	
		N	EMACIDE
5.26	2.24		7.44

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

 Stratum
 d.f.
 s.e.
 cv%

 BLOCK.WP
 21
 7.44
 19.8

PERCENTAGE WARE 4.4CM (1.75 INCH) RIDDLE

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

NEMACIDE	NONE	OXAMYL	Mean
VARIETY			
BARD	89.1	90.2	89.7
CARA	86.6	82.0	84.3
COSTELLA	88.2	90.7	89.4
DESIREE	89.8	92.3	91.0
ESTIMA	90.7	93.0	91.9
JAVELIN	82.4	87.3	84.9
PIPER	83.9	87.3	85.6
RECORD	80.6	87.6	84.1
ROMANO	80.2	86.0	83.1
SQUIRE	93.4	91.0	92.2
WILJA	83.1	88.1	85.6
Mean	86.2	88.7	87.4