ROTHAMSTED RESEARCH

Yields of the Field Experiments 1984

Full Table of Content

84/W/CS/273 Intensive Potatoes - Potatoes, S. Barley

Rothamsted Research

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84/W/CS/273

INTENSIVE POTATOES

Object: To study the effects of a range of frequencies of cropping on the occurrence of pests and diseases and on the yield of potatoes - Woburn Lansome III.

Sponsors: A.G. Whitehead, T.M. Addiscott, P. Etheridge, D.A. Govier, I.F. Henderson, G.A. Hide, D.H. Lapwood, G.C. Scott.

The third year, s. barley, potatoes.

For previous years see 82-83/W/CS/273.

Design: In the third year: 2 randomised blocks of 5 plots split into 8

Whole plot dimensions: 9.00 x 24.7.

Treatments: All combinations of:-

Whole plots	Crop sequences and potato varieties:		
1. CROP SEQ	1982	1983	1984
PD B PP	Potatoes, Desiree	S. barley	Potatoes, Maris Piper
B B PD	S. barley	S. barley	Potatoes, Desiree (triplicated)
PD B PD	Potatoes, Desiree	S. barley	Potatoes, Desiree

Sub plots

2. SD TREAT	Seed treatment:
NONE	None
TOL+IMAZ	Tolclofos methyl at 250 g and imazalil at 10 g per tonne of tubers
3. NEMACIDE	Nematicide:
NONE	None
OXAMYL	Oxamyl at 5.0 kg worked in to seedbed
4. MOLLCIDE	Molluscicide:
NONE	None
METHIOCA	Methiocarb at 0.23 kg applied as pellets on 26 July, 1984, 8 Aug, 22 Aug, 5 Sept.

NOTES: (1) Additional plots were sown to s. barley for cropping sequences with differing frequencies of potatoes. Barley yields were not taken.

https://doi.org/10.23637/ERADOC-1-32

84/W/CS/273

(2) Irrigation was applied to the potatoes as follows (mm water):

10-11 May	12.5	11-12 July	25
18 May	12.5	13 July	12.5
15 June	12.5	23-24 July	25
18 June	12.5	30 July-2 Aug	25
4-5 July	25	3 Aug	12.5
		Total	175

Standard applications:
Potatoes: Manures: (0:18:36) at 410 kg, (10:10:15+4.5 Mg) at 3000 kg. Weedkillers: Glyphosate at 1.4 kg in 250 l. Linuron at 1.3 l in 250 l. Fungicides: Maneb at 0.36 kg with zineb at 0.04 kg in 250 l with the insecticide. Fentin hydroxide at 0.28 kg in 250 l on six occasions, with the insecticide on the second and third occasions. Insecticide: Pirimicarb at 0.14 kg on three occasions.
S. barley: Manures: (20:10:10) at 640 kg. Weedkillers: Glyphosate at 1.4 kg in 250 l. Mecoprop with bromoxynil and ioxynil (as 'Brittox' at 2.5 l) in 250 l with the fungicide. Fungicide: Tridemorph at 0.3 kg.

Seed: S. barley: Triumph, dressed ethirimol, sown at 160 kg.

Cultivations, etc.:-
Potatoes: Glyphosate applied: 7 Sept, 1983. PK applied: 16 Nov. Ploughed: 13 Dec. NPK with Mg applied, spring-tine cultivated: 5 Apr, 1984. Oxamyl applied, rotary cultivated, potatoes planted: 13 Apr. Linuron applied: 3 May. Maneb, zineb with pirimicarb applied: 19 June. Fentin hydroxide with pirimicarb applied: 18 July, 20 July. Fentin hydroxide applied: 3 July, 1 Aug, 28 Aug, 12 Sept. Lifted: 1 Oct.
S. barley: Glyphosate applied to plots after barley: 7 Sept, 1983. Ploughed after barley: 13 Dec. Deep-tine cultivated after potatoes: 16 Jan, 1984. NPK applied: 15 Mar. Spring-tine cultivated: 16 Mar. Spring-tine cultivated with crumbler attached, seed sown: 19 Mar. 'Brittox' with fungicide applied: 15 May. Combine harvested: 18 Aug.

NOTES: (1) Plant samples were taken in August for tuber disease assessments.
(2) Potato cyst nematode numbers were assessed before planting and after harvest.
(3) Slug damage assessments were made on the lifted crop.

https://doi.org/10.23637/ERADOC-1-32

84/W/CS/273

TOTAL TUBERS TONNES/HECTARE

***** TABLES OF MEANS *****

SD TREAT CROP SEQ	NONE	TOL+IMAZ	MEAN
PD B PP	36.5	37.7	37.1
B B PD	51.3	48.5	49.9
PD B PD	31.0	26.5	28.8
MEAN	44.3	42.0	43.1

NEMACIDE CROP SEQ	NONE	OXAMYL	MEAN
PD B PP	23.9	50.3	37.1
B B PD	43.1	56.8	49.9
PD B PD	15.7	41.9	28.8
MEAN	33.8	52.5	43.1

NEMACIDE SD TREAT	NONE	OXAMYL	MEAN
NONE	34.3	54.3	44.3
TOL+IMAZ	33.2	50.7	42.0
MEAN	33.8	52.5	43.1

MOLLCIDE CROP SEQ	NONE	METHIOCA	MEAN
PD B PP	40.8	33.4	37.1
B B PD	51.6	48.3	49.9
PD B PD	31.4	26.1	28.8
MEAN	45.4	40.9	43.1

MOLLCIDE SD TREAT	NONE	METHIOCA	MEAN
NONE	45.9	42.7	44.3
TOL+IMAZ	44.9	39.0	42.0
MEAN	45.4	40.9	43.1

MOLLCIDE NEMACIDE	NONE	METHIOCA	MEAN
NONE	36.0	31.5	33.8
OXAMYL	54.7	50.2	52.5
MEAN	45.4	40.9	43.1

SD TREAT	NONE		TOL+IMAZ	
NEMACIDE	NONE	OXAMYL	NONE	OXAMYL
CROP SEQ				
PD B PP	22.8	50.2	25.1	50.4
B B PD	44.1	58.6	42.1	54.9
PD B PD	16.6	45.4	14.7	38.3

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84/W/CS/273

TOTAL TUBERS TONNES/HECTARE

***** TABLES OF MEANS *****

SD TREAT	NONE		TOL+IMAZ	
MOLLCIDE	NONE	METHIOCA	NONE	METHIOCA
CROP SEQ				
PD B PP	39.3	33.6	42.3	33.2
B B PD	52.6	50.1	50.6	46.5
PD B PD	32.2	29.8	30.7	22.3

NEMACIDE	NONE		OXAMYL	
MOLLCIDE	NONE	METHIOCA	NONE	METHIOCA
CROP SEQ				
PD B PP	27.9	20.0	53.7	46.8
B B PD	44.5	41.7	58.7	54.9
PD B PD	19.0	12.3	43.9	39.8

NEMACIDE	NONE		OXAMYL	
MOLLCIDE	NONE	METHIOCA	NONE	METHIOCA
SD TREAT				
NONE	36.7	32.0	55.0	53.5
TOL+IMAZ	35.4	31.1	54.5	47.0

NEMACIDE		NONE		OXAMYL	
MOLLCIDE		NONE	METHIOCA	NONE	METHIOCA
CROP SEQ	SD TREAT				
PD B PP	NONE	30.0	15.6	48.6	51.7
	TOL+IMAZ	25.7	24.5	58.8	41.9
B B PD	NONE	44.8	43.3	60.4	56.8
	TOL+IMAZ	44.2	40.1	57.0	52.9
PD B PD	NONE	19.1	14.2	45.3	45.5
	TOL+IMAZ	18.9	10.5	42.4	34.2

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	CROP SEQ	SD TREAT	NEMACIDE	MOLLCIDE	
SED	6.92				MIN REP
	5.65	1.86	1.86	1.86	MAX-MIN

TABLE	CROP SEQ SD TREAT	CROP SEQ NEMACIDE	SD TREAT NEMACIDE	CROP SEQ MOLLCIDE	
SED	7.53	7.53		7.53	MIN REP
	6.14	6.14	2.64	6.14	MAX-MIN
	4.34	4.34		4.34	MAX REP
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:					
CROP SEQ	4.17	4.17		4.17	MIN REP
	3.40	3.40		3.40	MAX-MIN
	2.41	2.41		2.41	MAX REP

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84/W/CS/273

TOTAL TUBERS TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	SD TREAT MOLLCIDE	NEMACIDE MOLLCIDE	CROP SEQ SD TREAT NEMACIDE	CROP SEQ SD TREAT MOLLCIDE	
SED			8.60	8.60	MIN REP
	2.64	2.64	7.02	7.02	MAX-MIN
			4.97	4.97	MAX REP
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:					
CROP SEQ			5.89	5.89	MIN REP
			4.81	4.81	MAX-MIN
			3.40	3.40	MAX REP

TABLE	CROP SEQ NEMACIDE MOLLCIDE	SD TREAT NEMACIDE MOLLCIDE	CROP SEQ SD TREAT NEMACIDE MOLLCIDE	
SED	8.60		10.43	MIN REP
	7.02	3.73	8.51	MAX-MIN
	4.97		6.02	MAX REP
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
CROP SEQ	5.89		8.34	MIN REP
	4.81		6.81	MAX-MIN
	3.40		4.81	MAX REP

	CROP SEQ
MAX REP	B B PD ONLY
MAX-MIN	B B PD V ANY OF REMAINDER
MIN REP	ANY OF REMAINDER

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	6	6.92	16.1
BLOCK.WP.SP	49	8.34	19.3

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84/W/CS/273

PERCENTAGE WARE 4.44 CM (1.75 INCH) RIDDLE

***** TABLES OF MEANS *****

SD TREAT	NONE	TOL+IMAZ	MEAN
CROP SEQ			
PD B PP	60.6	64.5	67.6
B B PD	70.1	73.1	71.6
PD B PD	53.8	61.7	57.7
MEAN	64.9	69.1	67.0

NEMACIDE	NONE	OXAMYL	MEAN
CROP SEQ			
PD B PP	60.6	64.5	62.6
B B PD	66.4	76.8	71.6
PD B PD	45.2	70.3	57.7
MEAN	61.0	73.0	67.0

NEMACIDE	NONE	OXAMYL	MEAN
SD TREAT			
NONE	59.2	70.7	64.9
TOL+IMAZ	62.9	75.3	69.1
MEAN	61.0	73.0	67.0

MOLLCIDE	NONE	METHIOCA	MEAN
CROP SEQ			
PD B PP	61.0	64.2	62.6
B B PD	73.1	70.1	71.6
PD B PD	59.2	56.2	57.7
MEAN	67.9	66.1	67.0

MOLLCIDE	NONE	METHIOCA	MEAN
SD TREAT			
NONE	65.0	64.8	64.9
TOL+IMAZ	70.8	67.5	69.1
MEAN	67.9	66.1	67.0

MOLLCIDE	NONE	METHIOCA	MEAN
NEMACIDE			
NONE	63.4	58.7	61.0
OXAMYL	72.4	73.6	73.0
MEAN	67.9	66.1	67.0

SD TREAT	NONE		TOL+IMAZ	
NEMACIDE	NONE	OXAMYL	NONE	OXAMYL
CROP SEQ				
PD B PP	58.5	62.7	62.8	66.3
B B PD	64.9	75.3	68.0	78.2
PD B PD	42.8	64.8	47.6	75.8

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84/W/CS/273

PERCENTAGE WARE 4.44 CM (1.75 INCH) RIDDLE

***** TABLES OF MEANS *****

SD TREAT	NONE		TOL+IMAZ	
MOLLCIDE	NONE	METHIOCA	NONE	METHIOCA
CROP SEQ				
PD B PP	57.1	64.0	64.8	64.3
B B PD	71.2	69.0	75.0	71.2
PD B PD	54.4	53.1	64.0	59.3

NEMACIDE	NONE		OXAMYL	
MOLLCIDE	NONE	METHIOCA	NONE	METHIOCA
CROP SEQ				
PD B PP	62.6	58.6	59.3	69.7
B B PD	68.4	64.5	77.8	75.7
PD B PD	49.1	41.2	69.3	71.3

NEMACIDE	NONE		OXAMYL	
MOLLCIDE	NONE	METHIOCA	NONE	METHIOCA
SD TREAT				
NONE	60.6	57.8	69.5	71.9
TOL+IMAZ	66.2	59.6	75.3	75.3

NEMACIDE		NONE		OXAMYL	
MOLLCIDE		NONE	METHIOCA	NONE	METHIOCA
CROP SEQ	SD TREAT				
PD B PP	NONE	60.9	56.0	53.4	72.0
	TOL+IMAZ	64.4	61.2	65.2	67.4
B B PD	NONE	65.4	64.4	77.0	73.7
	TOL+IMAZ	71.3	64.6	78.6	77.8
PD B PD	NONE	45.8	39.7	63.0	66.5
	TOL+IMAZ	52.4	42.7	75.6	76.0

SUB PLOT AREA HARVESTED 0.00075

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