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79/R/P/4 and 79/W/P/4 Seed Stocks and Times of Applying Fungicides - Potatoes

Rothamsted Research

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79/R/P/4 and 79/W/P/4

POTATOES

SEED STOCKS & TIMES OF APPLYING FUNGICIDES

Object: To study the effects of times of applying fungicides to seed tubers soon after lifting on the yield and infection of progeny tubers and on diseases in subsequent storage - Rothamsted (R) Delafield and Woburn (W) Horsepool.

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

Design: 3 experiments each 4 randomised blocks of 20 plots.

Whole plot dimensions: 1.42 x 9.53 at both sites.

Treatments: Three experiments: Rothamsted, variety King Edward (KE)
Rothamsted, variety Pentland Crown (PC)
Woburn, Pentland Crown (PC)
each tested all combinations of:-

1. SD STOCK
R R&W
KE PC

PER FS1 PER FS1
LIN OG LIN OG
ANG OG ROTH OG
HER OG ESS OG
Seed stock source and health certificate:
R R
KE KE

Perthshire FS1 Perthshire FS1
Lincolnshire Once grown Lincolnshire Once grown
Angus Once grown Rothamsted Once grown
Hertfordshire (B. Stort- Essex Once grown
ford Once grown)
 2. FUNGICIDE

IMAZALIL
THIABEND
Fungicides:

Imazalil at 0.8 g in 2 l per t of tubers
Thiabendazole at 40 g in 2 l per t of tubers
 3. FUNGTIME

LIFT
LIFT+BOX
Times of applying fungicides:

At lifting (R) 24 Oct, (W) 17 Oct
At lifting and at boxing (R&W) 20 Nov
- plus four extra treatments:
- | | | |
|-----------------|--|---|
| NO FUNG | | Seed not treated, fungicide seed stocks as above: |
| R R&W | | |
| KE PC | | |
| PER FS1 PER FS1 | | |
| LIN OG LIN OG | | |
| ANG OG ROTH OG | | |
| HER OG ESS OG | | |

79/R/P/4 and 79/W/P/4

Basal applications:

Delafield (R): Manures: (13:13:20) at 1510 kg. Weedkillers: Linuron at 1.3 kg with paraquat at 0.42 kg ion in 220 l. Fungicide: Mancozeb at 1.3 kg in 220 l applied six times, with insecticide on the first two occasions. Insecticide: Pirimicarb at 0.14 kg applied on two occasions. Desiccant: Undiluted BOV at 170 l.

Horsepool (W): Manures: (13:13:20) at 1850 kg. Weedkillers: Linuron at 1.0 kg with paraquat at 0.28 kg ion in 250 l. Fungicide: Mancozeb at 1.3 kg in 250 l applied six times, with insecticide on the first two occasions. Insecticide: Pirimicarb at 0.14 kg applied on two occasions. Desiccant: Undiluted BOV at 170 l.

Cultivations, etc.:-

Delafield (R): Ploughed: 12 Dec, 1978. Heavy spring-tine cultivated: 21 Apr, 1979. NPK applied: 1 May. Spike rotary cultivated: 8 May. Ridged up, hand planted and split back: 9 May. Grubbed: 16 May. Rotary ridged: 18 May. Weedkillers applied: 30 May. Fungicide applied: 26 June, 5 July, 20 July, 3 Aug, 15 Aug, 4 Sept. Insecticide applied: 26 June, 5 July. Desiccant applied: 21 Sept. Lifted: 12 Oct. Previous crops: Barley 1977, kale 1978.

Horsepool (W): Heavy spring-tine cultivated: 6 Sept, 1978. Subsoiled, tines 58 cm deep, 140 cm apart: 12 Sept. Rotary cultivated: 9 Nov. Ploughed: 24 Nov. NPK applied: 5 May, 1979. Heavy spring-tine cultivated: 8 May. Ridged up, hand planted, split back: 10 May. Weedkillers applied: 25 May. Fungicide applied: 27 June, 10 July, 23 July, 10 Aug, 25 Aug, 6 Sept. Insecticide applied: 27 June, 10 July. Desiccant applied: 24 Sept. Lifted: 15 Oct. Previous crops: Wheat 1977, W. oats 1978.

NOTE: Plant emergence counts were made in June and plant samples were taken in August for estimates of stem and tuber infections.

79/R/P/4 DELAFIELD(R)

KING EDWARD

TOTAL TUBERS TONNES/HECTARE

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

FUNGCIDE	IMAZALIL	THIABEND	MEAN
SD STOCK			
PER FS1	37.5	36.6	37.1
LIN OG	29.8	30.6	30.2
ANG OG	33.1	35.2	34.1
HER OG	31.0	31.5	31.2

MEAN	32.9	33.5	33.2
------	------	------	------

FUNGTIME	LIFT	LIFT+BOX	MEAN
SD STOCK			
PER FS1	38.2	35.9	37.1
LIN OG	30.6	29.8	30.2
ANG OG	35.0	33.3	34.1
HER OG	30.4	32.1	31.2

MEAN	33.6	32.8	33.2
------	------	------	------

FUNGTIME	LIFT	LIFT+BOX	MEAN
FUNGCIDE			
IMAZALIL	33.1	32.6	32.9
THIABEND	34.0	32.9	33.5

MEAN	33.6	32.8	33.2
------	------	------	------

FUNGCIDE	IMAZALIL	THIABEND
FUNGTIME	LIFT	LIFT+BOX
SD STOCK		
PER FS1	38.7	36.4
LIN OG	29.7	29.9
ANG OG	34.0	32.2
HER OG	30.1	31.9

NO FUNG	PER FS1	LIN OG	ANG OG	HER OG	MEAN
	36.9	28.3	33.4	29.2	31.9

GRAND MEAN 32.9

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

TABLE	NO FUNG	SD STOCK	FUNGCIDE	FUNGTIME
SED	1.13	0.56	0.40	0.40
TABLE	SD STOCK	SD STOCK	FUNGCIDE	SD STOCK
	FUNGCIDE	FUNGTIME	FUNGTIME	FUNGCIDE
				FUNGTIME
				& NO FUNG
SED	0.80	0.80	0.56	1.13

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

STRATUM	DF	SE	CV%
BLOCK.WP	57	1.60	4.9

79/R/P/4 DELAFIELD(R)

KING EDWARD

PERCENTAGE WARE 4.44CM (1.75INCH) RIDDLE

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

FUNGCIDE	IMAZALIL	THIABEND	MEAN
SD STOCK			
PER FS1	34.7	29.9	32.3
LIN OG	32.7	28.1	30.4
ANG OG	34.8	31.4	33.1
HER OG	38.2	35.4	36.8

MEAN	35.1	31.2	33.2
------	------	------	------

FUNGTIME	LIFT	LIFT+BOX	MEAN
SD STOCK			
PER FS1	34.0	30.6	32.3
LIN OG	31.9	28.9	30.4
ANG OG	34.5	31.6	33.1
HER OG	39.2	34.4	36.8

MEAN	34.9	31.4	33.2
------	------	------	------

FUNGTIME	LIFT	LIFT+BOX	MEAN
FUNGCIDE			
IMAZALIL	36.2	34.0	35.1
THIABEND	33.6	28.8	31.2

MEAN	34.9	31.4	33.2
------	------	------	------

FUNGCIDE	IMAZALIL	THIABEND	
FUNGTIME	LIFT	LIFT+BOX	LIFT LIFT+BOX
SD STOCK			
PER FS1	37.2	32.3	30.9 29.0
LIN OG	33.7	31.7	30.0 26.2
ANG OG	33.1	36.4	36.0 26.9
HER OG	40.8	35.6	37.5 33.3

NO FUNG	PER FS1	LIN OG	ANG OG	HER OG	MEAN
	30.4	40.4	38.3	32.0	35.3

GRAND MEAN 33.6

PLOT AREA HARVESTED 0.00114

79/R/P/4 DELAFIELD(R)

PENTLAND CROWN

TOTAL TUBERS TONNES/HECTARE

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

FUNGCIDE	IMAZALIL	THIABEND	MEAN
SD STOCK			
PER FS1	31.7	31.7	31.7
LIN OG	31.2	30.3	30.7
ROTH OG	34.0	33.5	33.8
ESS OG	30.0	30.0	30.0

MEAN	31.7	31.4	31.6
------	------	------	------

FUNGTIME	LIFT	LIFT+BOX	MEAN
SD STOCK			
PER FS1	34.0	29.5	31.7
LIN OG	32.3	29.2	30.7
ROTH OG	34.5	33.0	33.8
ESS OG	29.4	30.6	30.0

MEAN	32.6	30.6	31.6
------	------	------	------

FUNGTIME	LIFT	LIFT+BOX	MEAN
FUNGCIDE			
IMAZALIL	33.0	30.4	31.7
THIABEND	32.1	30.7	31.4

MEAN	32.6	30.6	31.6
------	------	------	------

FUNGCIDE	IMAZALIL	THIABEND
FUNGTIME	LIFT	LIFT+BOX
SD STOCK		
PER FS1	33.5	30.0
LIN OG	33.3	29.1
ROTH OG	34.9	33.1
ESS OG	30.5	29.6

NO FUNG	PER FS1	LIN OG	ROTH OG	ESS OG	MEAN
	33.8	30.2	34.2	29.3	31.9

GRAND MEAN 31.6

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

TABLE	NO FUNG	SD STOCK	FUNGCIDE	FUNGTIME
SED	1.75	0.87	0.62	0.62
TABLE	SD STOCK	SD STOCK	FUNGCIDE	SD STOCK
	FUNGCIDE	FUNGTIME	FUNGTIME	FUNGCIDE
				FUNGTIME
				& NO FUNG
SED	1.24	1.24	0.87	1.75

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

STRATUM	DF	SE	CV%
BLOCK.WP	57	2.47	7.8

79/R/P/4 DELAFIELD(R)

PENTLAND CROWN

PERCENTAGE WARE 4.44CM (1.75INCH) RIDDLE

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

FUNGCIDE	IMAZALIL	THIABEND	MEAN
SD STOCK			
PER FS1	71.5	68.5	70.0
LIN OG	69.8	67.1	68.5
ROTH OG	62.3	63.9	63.1
ESS OG	73.0	70.8	71.9

MEAN	69.1	67.6	68.4
------	------	------	------

FUNGTIME	LIFT	LIFT+BOX	MEAN
SD STOCK			
PER FS1	70.8	69.1	70.0
LIN OG	69.2	67.8	68.5
ROTH OG	62.4	63.8	63.1
ESS OG	71.5	72.3	71.9

MEAN	68.4	68.3	68.4
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FUNGTIME	LIFT	LIFT+BOX	MEAN
FUNGCIDE			
IMAZALIL	68.7	69.6	69.1
THIABEND	68.2	66.9	67.6

MEAN	68.4	68.3	68.4
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FUNGCIDE	IMAZALIL	THIABEND	
FUNGTIME	LIFT	LIFT+BOX	LIFT LIFT+BOX
SD STOCK			
PER FS1	72.4	70.5	69.2 67.8
LIN OG	69.3	70.4	69.1 65.2
ROTH OG	62.4	62.2	62.4 65.4
ESS OG	70.7	75.2	72.2 69.4

NO FUNG	PER FS1	LIN OG	ROTH OG	ESS OG	MEAN
	59.2	67.3	57.3	62.6	61.6

GRAND MEAN 67.0

PLOT AREA HARVESTED 0.00114

79/W/P/4 HORSEPOOL(W)

PENTLAND CROWN

TOTAL TUBERS TONNES/HECTARE

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

FUNGCIDE	IMAZALIL	THIABEND	MEAN
SD STOCK			
PER FS1	37.1	33.9	35.5
LIN OG	37.6	38.3	38.0
ROTH OG	42.9	39.3	41.1
ESS OG	33.1	35.5	34.3
MEAN	37.7	36.8	37.2

FUNGTIME	LIFT	LIFT+BOX	MEAN
SD STOCK			
PER FS1	37.1	33.9	35.5
LIN OG	39.5	36.4	38.0
ROTH OG	39.6	42.6	41.1
ESS OG	37.3	31.3	34.3
MEAN	38.4	36.1	37.2

FUNGTIME	LIFT	LIFT+BOX	MEAN
FUNGCIDE			
IMAZALIL	39.3	36.1	37.7
THIABEND	37.5	36.0	36.8
MEAN	38.4	36.1	37.2

FUNGCIDE	IMAZALIL	THIABEND			
FUNGTIME	LIFT	LIFT+BOX	LIFT	LIFT+BOX	
SD STOCK					
PER FS1	40.4	33.8	33.8	34.1	
LIN OG	39.5	35.7	39.5	37.2	
ROTH OG	42.7	43.1	36.5	42.1	
ESS OG	34.5	31.8	40.2	30.8	
NO FUNG	PER FS1	LIN OG	ROTH OG	ESS OG	MEAN
	35.8	41.0	41.9	33.4	38.0

GRAND MEAN 37.4

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

TABLE	NO FUNG	SD STOCK	FUNGCIDE	FUNGTIME
SED	3.62	1.81	1.28	1.28
TABLE	SD STOCK	SD STOCK	FUNGCIDE	SD STOCK
	FUNGCIDE	FUNGTIME	FUNGTIME	FUNGCIDE
				FUNGTIME
				& NO FUNG
SED	2.56	2.56	1.81	3.62

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

STRATUM	DF	SE	CV%
BLOCK.WP	57	5.12	13.7

79/W/P/4 HORSEPOOL(W)

PENTLAND CROWN

PERCENTAGE WARE 4.44CM (1.75INCH) RIDDLE

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

FUNGCIDE	IMAZALIL	THIABEND	MEAN
SD STOCK			
PER FS1	76.3	69.4	72.9
LIN OG	76.7	77.0	76.9
ROTH OG	76.6	72.5	74.5
ESS OG	72.7	73.0	72.8

MEAN	75.6	73.0	74.3
------	------	------	------

FUNGTIME	LIFT	LIFT+BOX	MEAN
SD STOCK			
PER FS1	72.7	73.0	72.9
LIN OG	77.5	76.3	76.9
ROTH OG	74.0	75.0	74.5
ESS OG	74.8	70.9	72.8

MEAN	74.7	73.8	74.3
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FUNGTIME	LIFT	LIFT+BOX	MEAN
FUNGCIDE			
IMAZALIL	76.4	74.8	75.6
THIABEND	73.1	72.8	73.0

MEAN	74.7	73.8	74.3
------	------	------	------

FUNGCIDE	IMAZALIL	THIABEND	
FUNGTIME	LIFT	LIFT+BOX	LIFT LIFT+BOX
SD STOCK			
PER FS1	78.1	74.6	67.3 71.5
LIN OG	76.8	76.7	78.1 75.9
ROTH OG	75.8	77.4	72.3 72.6
ESS OG	74.9	70.5	74.7 71.3

NO FUNG	PER FS1	LIN OG	ROTH OG	ESS OG	MEAN
	74.7	77.4	77.7	74.5	76.1

GRAND MEAN 74.6

PLOT AREA HARVESTED 0.00114