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Yields of the Field Experiments 1973

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Potatoes

Rothamsted Research

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73/R/P/1 and 73/W/P/1

POTATOES

SEED STOCKS AND SEED TREATMENT

Object: To study the effects of treating tubers with fumigant and systemic fungicides on tuber-borne diseases and yield of potatoes - Rothamsted (R) Little Hoos and Woburn (W) Horsepool.

Sponsors: G.A. Hide, R.L. Griffith, F. Bell.

Design: 4 blocks of 8 plots split into 4 (plus one extra block for sampling).

Whole plot dimensions: 5.69 x 9.52. Area harvested: 0.00135.

Treatments: All combinations of:-

Whole plots: 1. Varieties:

VARIETY

Pentland Crown
King Edward, Little Hoos (R) only
Majestic
Maris Piper, Horsepool (W) only
Record

Crown
Edward
Majestic
Piper
Record

2. Seed health:

HEALTH

Once grown
Healthier

Onegrown
Healthy

Sub plots: 3. Fungicide to seed tubers:

FUNGICIDE

None
Benomyl
Sec-butylamine (0.28 l per tonne of seed)
Thiabendazole

None
Benomyl
Secbutyl
Thiabend

NOTE: Benomyl and Thiabendazole applied as 0.1% dip at pH3 for 5 minutes.
Sec-butylamine applied as a fumigant vapour.

Basal applications: Manures: (13:13:20) at 1500 kg, Little Hoos (R), 1830 kg Horsepool (W). Weedkillers: Paraquat at 0.56 kg ion in 280 l, Horsepool (W). Linuron at 1.2 kg with paraquat at 0.42 kg ion in 450 l, Little Hoos (R), 280 l Horsepool (W). Fungicide with insecticide: Mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 370 l, Little Hoos (R), 390 l Horsepool (W). Fungicide: Mancozeb at 1.3 kg, in 370 l on two occasions, Little Hoos (R), in 390 l on the first occasion, in 370 l on the second occasion, Horsepool (W).

T3/R/P/1 and T3/W/P/1

Cultivations, etc.:-

Little Hoos (R): Deep-tine cultivated three times: 7 Aug, 1972, 22 Aug, 11 Sept. NPK applied: 23 Mar, 1973. Rotary cultivated, potatoes planted: 13 Apr. Weedkiller applied: 18 May. Fungicide with insecticide applied: 2 July. Fungicide applied: 24 July, 9 Aug. Sprayed with undiluted BOV at 220 l: 18 Sept. Lifted: 10 Oct. Previous crops: Barley 1971, grass ley 1972.

Horsepool (W): Paraquat applied: 2 Oct, 1972. Ploughed: 3 Jan, 1973. NPK applied: 26 Mar. Rotary harrowed, potatoes planted: 12 Apr. Linuron and paraquat applied: 12 May. Grubbed: 6 June. Rotary ridged: 16 June. Fungicide with insecticide applied: 5 July. Fungicide applied: 26 July, 13 Aug. Sprayed with undiluted BOV at 220 l: 24 Sept. Lifted: 8 Oct. Previous crops: Barley 1971, beans 1972.

NOTE: Emergence counts were made in May. Samples were taken throughout the season for tuber-size distribution and disease assessments on growing progeny tubers. After burning off and before lifting, counts were made of plant and stem numbers. After harvest tubers were graded into 6 sizes and estimates were made of tuber infection with *Oospora*, *Rhizoctonia*, *Helminthosporium* and *Phoma*.

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

Little Hoos (R): Whole plot: 1.28 or 2.8% (21 d.f.)
Sub plot: 2.17 or 4.7% (72 d.f.)
Horsepool (W): Whole plot: 2.50 or 7.6% (21 d.f.)
Sub plot: 3.59 or 10.9% (72 d.f.)

73/R/P/1 and 73/W/P/1

TABLES OF MEANS

LITTLE HOOS (R)

TOTAL TUBERS: TONNES/HECTARE

VARIETY	HEALTH		FUNGICIDE				Mean
	Onegrown	Healthy	None	Benomyl	Secbutyl	Thiabend	
Crown	51.0	52.2	53.2	50.9	49.7	52.5	51.6
Edward	48.8	48.4	49.0	49.5	47.8	47.9	48.6
Majestic	47.4	51.9	49.8	49.7	48.9	50.2	49.6
Record	31.3	40.5	36.8	36.4	34.1	36.4	35.9
HEALTH							
	Onegrown		45.4	44.9	43.4	44.8	44.6
	Healthy		49.1	48.3	46.9	48.7	48.2
Mean			47.2	46.6	45.1	46.7	46.4

VARIETY	HEALTH				FUNGICIDE			
	None	Onegrown	Benomyl	Secbutyl	Thiabend	None	Benomyl	Secbutyl
Crown	51.5	50.5	49.6	52.3	55.0	51.2	49.9	52.7
Edward	49.2	49.8	48.8	47.4	48.8	49.3	46.9	48.4
Majestic	48.0	47.2	46.7	47.8	51.6	52.2	51.1	52.5
Record	32.9	32.1	28.6	31.8	40.7	40.7	39.5	41.0

STANDARD ERRORS OF DIFFERENCES

VARIETY	HEALTH	FUNGICIDE	VARIETY	VARIETY	HEALTH	VARIETY
			HEALTH	FUNGICIDE	FUNGICIDE	HEALTH
						FUNGICIDE
0.64	0.45	0.54	0.90	1.14	0.80	1.61
Except when comparing means with same levels of						
VARIETY				1.09		
HEALTH					0.77	
VARIETY.HEALTH						1.54

73/R/P/1 and 73/W/P/1

LITTLE HDOS (R)

PERCENTAGE WARE: 4.44 CM (1.75 INCH) RIDDLE

VARIETY	HEALTH		FUNGICIDE				Mean
	Onegrown	Healthy	None	Benomyl	Secbutyl	Thiabend	
Crown	95.3	94.5	94.8	94.1	96.0	94.7	94.9
Edward	75.5	72.1	74.0	70.3	76.7	74.1	73.8
Majestic	85.1	83.4	85.2	83.2	84.0	84.8	84.3
Record	82.1	83.4	83.1	82.6	83.3	82.0	82.8
HEALTH							
	Onegrown		85.5	83.1	85.1	84.3	84.5
	Healthy		83.0	82.0	84.9	83.5	83.4
Mean			84.3	82.5	85.0	83.9	83.9

VARIETY	HEALTH				FUNGICIDE			
	None	Onegrown	Secbutyl	Thiabend	None	Benomyl	Secbutyl	Thiabend
Crown	95.5	94.8	96.2	94.9	94.2	93.4	95.9	94.5
Edward	76.3	71.5	77.9	76.4	71.8	69.0	75.6	71.8
Majestic	87.4	84.1	83.4	85.7	83.0	82.3	84.6	83.9
Record	83.0	81.8	83.0	80.4	83.3	83.4	83.6	83.5

73/R/P/1 and 73/W/P/1

HORSEPOOL (W)

TOTAL TUBERS: TONNES/HECTARE

VARIETY	HEALTH		FUNGICIDE				Mean
	Onegrown	Healthy	None	Benomyl	Secbutyl	Thiabend	
Crown	33.4	33.6	33.6	31.7	36.5	32.3	33.5
Majestic	32.0	32.2	31.1	32.5	31.2	33.4	32.1
Piper	33.7	33.6	32.8	34.2	33.4	34.2	33.6
Record	32.4	31.4	32.3	34.9	27.8	32.6	31.9
	HEALTH						
	Onegrown		31.7	33.7	33.4	32.8	32.9
	Healthy		33.3	33.0	31.0	33.5	32.7
Mean			32.5	33.3	32.2	33.1	32.8

VARIETY	HEALTH				FUNGICIDE			
	None	Onegrown	Benomyl	Secbutyl	Thiabend	None	Benomyl	Secbutyl
Crown	34.0	31.9	37.0	30.8	33.2	31.5	36.0	33.8
Majestic	29.6	32.2	33.2	33.0	32.7	32.8	29.3	33.8
Piper	31.9	34.9	34.4	33.7	33.8	33.5	32.4	34.7
Record	31.2	35.7	29.3	33.6	33.3	34.2	26.3	31.7

STANDARD ERRORS OF DIFFERENCES

VARIETY	HEALTH	FUNGICIDE	VARIETY	VARIETY	HEALTH	VARIETY
	HEALTH		HEALTH	FUNGICIDE	FUNGICIDE	HEALTH
1.25	0.88	0.90	1.77	1.99	1.41	2.82
Except when comparing means with same levels of				1.79		
VARIETY					1.27	
HEALTH						2.54
VARIETY. HEALTH						

73/R/P/1 and 73/W/P/1

HORSEPOOL (W)

PERCENTAGE WARE: 4.44 CM (1.75 INCH) RIDDLE

VARIETY	HEALTH		FUNGICIDE				Mean		
	Onegrown	Healthy	None	Benomyl	Secbutyl	Thiabend			
Crown	93.0	91.0	91.0	91.3	93.4	92.1	92.0		
Majestic	80.7	79.9	79.7	79.8	79.2	82.5	80.3		
Piper	82.1	82.0	83.7	82.1	81.5	81.0	82.1		
Record	77.4	78.4	79.1	78.0	77.1	77.4	77.9		
	HEALTH								
	Onegrown		84.4	83.2	82.5	83.1	83.3		
	Healthy		82.3	82.5	83.1	83.5	82.8		
Mean			83.4	82.8	82.8	83.3	83.1		
VARIETY	HEALTH				FUNGICIDE				
	None	Onegrown	Benomyl	Secbutyl	Thiabend	None	Benomyl	Secbutyl	Thiabend
Crown	92.0	93.2	94.5	92.1	90.0	89.4	92.3	92.2	
Majestic	79.7	80.5	79.1	83.4	79.7	79.0	79.3	81.6	
Piper	85.4	82.4	79.9	80.9	81.9	81.9	83.0	81.2	
Record	80.6	76.6	76.5	76.0	77.6	79.5	77.7	78.9	

73/R/P/2

POTATOES

BLIGHT AND APHID REFERENCE PLOTS

Object: To study the separate and combined effect of sprays to control blight and aphids on potatoes - Little Hoos.

Sponsors: J.M. Hirst, O.J. Stedman, R.W. Gibson.

Design: 4 randomised blocks of 7 plots split into 3.

Whole plot dimensions: 8.53 x 9.52. Sub plot area harvested: 0.00271.

Treatments: All combinations of:-

Whole plots: 1. Blight fungicide: FUNGICIDE

None None

Mancozeb applied on 3 occasions
at 1.3 kg in 370 l Mancozeb

2. Aphicide: APHICIDE

None None

Demeton-s-methyl applied on 4
occasions, starting early, on
14 June, at 0.25 kg in 370 l Demeton1

Demeton-s-methyl applied on 3
occasions, starting with first
blight spray on 3 July, at
0.25 kg in 370 l Demeton2

Sub plots: 3. Varieties: VARIETY

King Edward Edward

Majestic Majestic

Pentland Crown Crown

together with one extra treatment, sprayed mancozeb only and split
for varieties as above, plot used for sampling (no yields recorded).

Basal applications: Manures: (13:13:20) at 1500 kg. Weedkillers:
Linuron at 1.2 kg with paraquat at 0.4 kg ion in 450 l.

TB/R/P/2

Cultivations, etc.:— Deep-tine cultivated: 7 Aug, 1972, twice 22 Aug, once 11 Sept. MFK applied: 23 Mar, 1973. Rotary cultivated: 13 Apr. Seed planted: 16 Apr. Weedkiller applied: 15 May. Grubbed: 8 June. Insecticide applied to Donatoni plots: 14 June. Rotaridged: 15 June. Insecticide with fungicide applied: 3 and 24 July, 11 Aug. Sprayed with undiluted BOV at 220 l: 18 Sept. Lifted: 12 Oct. Previous crops: Barley 1971, grass 1972.

- NOTES: (1) Aphids were counted fortnightly during June and July.
(2) Samples were taken for bulking and size distribution of tubers on 18 June, 2, 16, 30 July, 13, 28 Aug, and 10 Sept.
(3) Estimates were made of the percentage of haulm destroyed by blight and of tubers blighted.

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

Whole plot: 1.95 or 4.4% (15 d.f.)

Sub plot: 4.13 or 9.2% (36 d.f.)

75/R/P/2

3

TABLES OF MEANS

TOTAL TREES: TONNES/HECTARE

	None	APHICIDE		VARIETY			Mean
		Daneton1	Daneton2	Edward	Majestic	Crown	
FUNGICIDE							
None	43.5	43.3	45.1	43.6	44.2	44.2	44.0
Mancozeb	46.4	44.4	45.7	45.3	45.0	46.2	45.5
		APHICIDE					
		None		44.5	45.6	44.2	44.9
		Daneton1		44.2	41.5	45.7	43.8
		Daneton2		44.2	46.6	45.5	45.4
Mean				44.4	44.6	45.2	44.7

APHICIDE	None			Daneton1			Daneton2		
VARIETY	Edward	Majestic	Crown	Edward	Majestic	Crown	Edward	Majestic	Crown
FUNGICIDE									
None	42.8	45.5	42.2	44.2	41.1	44.5	43.7	45.9	45.8
Mancozeb	47.0	45.8	46.3	44.2	42.0	47.0	44.7	47.3	45.2

STANDARD ERRORS OF DIFFERENCES

FUNGICIDE	APHICIDE	VARIETY	FUNGICIDE APHICIDE	FUNGICIDE VARIETY	APHICIDE VARIETY	FUNGICIDE APHICIDE VARIETY
0.80	0.98	1.19	1.38	1.59	1.95	2.75
Except when comparing means with same levels of						
FUNGICIDE				1.68		
APHICIDE					2.06	
FUNGICIDE.APHICIDE						2.92

73/R/P/2

PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

	APHICIDE			VARIETY			Mean
	None	Demeton1	Demeton2	Edward	Majestic	Crown	
FUNGICIDE							
None	97.6	97.5	97.9	97.4	97.8	97.7	97.6
Mancozeb	97.5	97.3	97.6	97.4	97.4	97.7	97.5
		APHICIDE					
		None		97.2	97.6	97.8	97.5
		Demeton1		97.4	96.9	97.9	97.4
		Demeton2		97.6	98.3	97.4	97.8
Mean				97.4	97.6	97.7	97.6

	None			Demeton1			Demeton2		
	Edward	Majestic	Crown	Edward	Majestic	Crown	Edward	Majestic	Crown
FUNGICIDE									
None	96.6	98.1	98.0	97.8	96.9	97.7	97.6	98.5	97.5
Mancozeb	97.7	97.1	97.6	96.9	97.0	98.0	97.5	98.2	97.3

73/W/P/2

POTATOES

CONTROL OF VERTICILLIUM

Object: To study the effects of trace elements, benomyl and forms of nitrogen on yields and incidence of Verticillium of potatoes - Woburn Broadmead I.

Sponsor: G.A. Hide.

Design: 2 blocks of 2 plots, split into 6.

Whole plot dimensions: 5.69 x 27.4. **Area harvested:** 0.00108.

Treatments: All combinations of:-

Whole plots:	1. Forms of nitrogen (applied at 163 kg N):	FORM
	Sulphate of ammonia	SA
	Nitrate of soda	NS
Sub plots:	2. Foliar sprays and drench:	SPRAY
	None	O
	Foliar spray of trace elements	TE
	Foliar spray of trace elements with NPK fertiliser	TEF
	Single foliar spray of benomyl	BS1
	Three foliar sprays of benomyl	BS3
	Soil drench of benomyl at crop emergence	BD

- NOTE:** (1) The foliar spray of trace elements contained ferrexanol, borax, ammonium molybdate, and sulphate of magnesium, manganese, copper, cobalt and zinc, applied at a total rate of 0.10 kg. The foliar spray of trace elements with NPK, included in addition, compound fertiliser (22:21:17) at 2.35 kg. Both sprays were applied in 540 l.
- (2) Benomyl was applied as a spray at 1.1 kg in 540 l to BS1, at 2.37 kg in 540 l repeated on three occasions to BS3 and at 1.1 kg in 7400 l as a drench to BD.
- (3) Because plants died earlier than expected, a planned fourth benomyl spray was omitted.

73/W/P/2

Basal applications: Manures: (0:14:28) at 1140 kg. Epsom salts at 650 kg. Weedkillers: Mecoprop at 2.5 kg in 280 l. Paraquat at 0.56 kg ion in 280 l on two occasions. Linuron at 1.7 kg plus paraquat at 0.42 kg ion in 280 l. Fungicide with insecticide: Mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 390 l. Fungicide: Mancozeb at 1.3 kg in 390 l on the first occasion and in 370 l on the second occasion.

Variety: Pentland Dell.

Cultivations, etc.: Mecoprop applied: 13 Mar, 1973. Paraquat applied: 17 Mar. Basal PK and Mg and test N applied: 28 Mar. Deep-tine cultivated: 5 Apr. Rotary cultivated twice: 11 Apr, 17 Apr. Potatoes planted: 18 Apr. Linuron plus paraquat applied: 14 May. Paraquat applied: 21 May. Soil drench applied: 5 June. Grubbed: 6 June. Rotary ridged: 16 June. Foliar sprays applied to TE, TEF, B51 and B53 plots: 28 June. Fungicide with insecticide applied: 5 July. Additional foliar sprays applied to B53 plots: 11 July, 17 July. Fungicide applied twice: 26 July, 13 Aug. Haulm mechanically destroyed: 23 Aug. Potatoes lifted: 10 Sept. Previous crops: Beans 1971, winter wheat 1972.

- NOTES: (4) Verticillium leaf symptom scores were made in June and July.
(5) Yields were poor and there was a large difference between the two blocks, (associated with a difference in past cropping) no standard errors are presented.

73/W/P/2

TABLES OF MEANS

	SPRAY						Mean
	O	TE	TEF	BS1	BS3	BD	
FORM	TOTAL TUBERS: TONNES/HECTARE						
SA	5.1	5.0	6.0	6.4	5.3	4.9	5.4
NS	3.3	2.3	4.6	4.8	3.5	5.4	4.0
Mean	4.2	3.6	5.3	5.6	4.4	5.2	4.7

FORM	PERCENTAGE WARE: 4.44 CM (1.75 INCH) RIDDLE						
SA	23.1	13.9	21.7	17.7	14.6	12.6	17.3
NS	4.6	0.0	5.7	17.9	16.3	8.7	8.9
Mean	13.9	7.0	13.7	17.8	15.5	10.7	13.1

73/R/P/3

POTATOES

SEED SOURCES

Object: To compare stocks of seed freed from tuber borne diseases, by the use of stem cuttings, with local once-grown and bought-in and certified stocks - Little Hoos.

Sponsors: G.A. Hide, F. Bell.

Design: 2 experiments each 2 randomised blocks of 24 plots.

Whole plot dimensions: 5.69 x 9.52. Area harvested: 0.00135.

Treatments:

LIFTER

One experiment with plots lifted by complete harvester

Complete

One experiment with plots lifted by elevator digger

Elevator

Treatments identical on both experiments

Sources of King Edward seed tubers

SEEDSRCE

Healthy (ex Scotland) two plots per block

Healthy

Healthier (ex Rothamsted once-grown) two

plots per block

Healthy+

Ten different certified stocks

CERT/1-CERT/10

Ten once-grown stocks

OG/1-OG/10

Basal applications: Manures: (13:13:20) at 1500 kg. Weedkillers: Linuron at 1.2 kg with paraquat at 0.4 kg ion in 450 l. Fungicide: Mancozeb at 1.3 kg in 370 l. Insecticide: Demeton-s-methyl at 0.25 kg applied with fungicide.

Cultivations, etc.: Deep-tine cultivated: 7 Aug, 1972, twice 22 Aug, once 11 Sept. NPK applied: 23 Mar, 1973. Rotary cultivated, seed planted: 17 Apr. Weedkiller applied: 15 May. Grubbed: 8 June. Rotoridged: 12 June. Insecticide with fungicide applied: 2 July. Fungicide applied: 24 July, 9 Aug. Sprayed with undiluted BOV at 220 l: 18 Sept. Lifted: 11 Oct. Previous crops: Barley 1971, grass 1972.

NOTE: Emergence counts were made on 29 May. Counts were made of plant and stem numbers after turning off and before lifting. Tubers were graded into 6 sizes and assessments made of *Gospora*, *Rhizoctonia*, *Helminthosporium* and *Phoma* infection.

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

LIFTER Complete: 3.20 or 6.9% (25 d.f.)

LIFTER Elevator: 1.94 or 4.5% (25 d.f.)

LIFTER Complete and Elevator: 2.56 or 5.7% (71 d.f.)

73/R/P/3

TABLES OF MEANS

TOTAL TUBERS: TONNES/HECTARE

SEEDSRCE	LIFTER		Mean
	Complete	Elevator	
Healthy	49.7	47.3	48.5
Healthy+	52.4	46.4	49.4
Cert/1	45.3	43.4	44.3
Cert/2	44.0	37.5	40.7
Cert/3	45.9	42.3	44.1
Cert/4	45.8	43.2	44.5
Cert/5	45.4	43.3	44.4
Cert/6	49.8	44.6	47.2
Cert/7	45.1	44.0	44.6
Cert/8	42.5	41.8	42.2
Cert/9	47.8	42.4	45.1
Cert/10	42.9	44.1	43.5
OG/1	44.5	41.7	43.1
OG/2	50.4	44.9	47.6
OG/3	43.7	41.9	42.8
OG/4	45.0	40.8	42.9
OG/5	42.9	40.6	41.7
OG/6	49.2	43.5	46.3
OG/7	40.3	42.1	41.2
OG/8	46.4	44.6	45.5
OG/9	46.7	45.6	46.1
OG/10	49.4	46.1	47.7
Mean	46.6	43.6	45.1

STANDARD ERRORS OF DIFFERENCES

	SEEDSRCE	SEEDSRCE LIFTER	
		LIFTER	
		Complete	Elevator
Healthy v Healthy+	1.28	2.27	1.37
Healthy or Healthy+ v any of remainder	1.57	2.77	1.68
Between any of remainder	1.81	3.20	1.94

73/R/P/3

PERCENTAGE WARE: 4.44 CM (1.75 INCH) RIDDLE

	LITTER		
	Complete	Elevator	Mean
SEEDS/CE			
Healthy	79.4	80.5	79.9
Healthy+	76.5	73.9	75.2
Cert/1	77.1	75.9	76.5
Cert/2	77.4	75.5	76.4
Cert/3	64.2	69.0	66.6
Cert/4	78.7	80.2	79.4
Cert/5	80.3	81.1	80.7
Cert/6	80.2	82.3	81.2
Cert/7	75.9	77.9	76.9
Cert/8	77.7	76.9	77.3
Cert/9	76.3	81.7	79.0
Cert/10	80.4	79.6	80.0
OG/1	74.8	75.6	75.2
OG/2	75.5	76.5	76.0
OG/3	76.4	73.0	74.7
OG/4	70.5	73.2	71.8
OG/5	71.2	71.2	71.2
OG/6	79.4	80.0	79.7
OG/7	71.5	77.6	74.6
OG/8	79.3	77.1	78.2
OG/9	79.4	78.6	79.0
OG/10	74.5	78.1	76.3
Mean	76.3	77.1	76.7

T3/W/P/3 and T3/R/P/22

POTATOES

VARIETIES

Object: To study the yield and susceptibility to diseases of newer varieties of potatoes - Rothamsted (R) Little Knott I and Woburn (W) Horsepool.

Sponsors: J.R. Moffatt, G.A. Hide.

Design: Little Knott I (R): 4 blocks of 6 plots.
Horsepool (W): 4 blocks of 5 plots.

Whole plot dimensions:- Little Knott I (R): 2.84 x 12.2. Area harvested: 0.00173.
Horsepool (W): 2.84 x 15.2. Area harvested: 0.00217.

Treatments: Varieties and seed stocks:-

VARIETY

Desiree, FS, Little Knott I (R) only
King Edward, VTSC, Little Knott I (R) only
Maris Piper, FS, Horsepool (W) only
Pentland Crown, VTSC
Pentland Ivory, FS
Stormont Enterprise ex N.I.A.B.
Ulster Lancer ex N.I.A.B.

Desiree
Edward
Piper
Crown
Ivory
Enterprise
Lancer

NOTE: All varieties at Rothamsted received phorate at 0.56 kg, as granules, at planting.

Basal applications: Manures: Ground chalk at 7.5 tonnes, Little Knott I (R). (13:13:20) at 1500 kg, Little Knott I (R) and 1830 kg, Horsepool (W).
Weedkillers: Paraquat at 0.56 kg ion in 280 l, Horsepool (W).
Linuron at 1.2 kg plus paraquat at 0.7 kg ion in 450 l, Little Knott I (R). Linuron at 1.2 kg plus paraquat at 0.42 kg ion in 280 l, Horsepool (W).
Fungicide with insecticide: Mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 370 l, Little Knott I (R), in 390 l Horsepool (W). Fungicide: Mancozeb at 1.3 kg in 390 l on the first occasion, 370 l on the second occasion Horsepool (W), in 370 l on two occasions, Little Knott I (R).

Cultivations, etc.: Little Knott I (R): Ground chalk applied: 23 Sept, 1972.
Ploughed: 27 Sept. NPK applied, rotary cultivated: 29 Mar, 1973.
Rotary cultivated, potatoes planted: 28 Apr. Weedkiller applied: 15 May.
Grubbed: 12 June. Fungicide with insecticide applied: 2 July. Fungicide applied: 24 July, 9 Aug. Sprayed with undiluted BOV at 220 l: 20 Sept.
Lifted: 5 Oct. Previous crops: Winter wheat 1971 and 1972.

T3/W/P/3 and T3/R/P/22

Horsepool (W): Paraquat applied: 2 Oct, 1972. Ploughed: 3 Jan, 1973.
NPK applied: 26 Mar. Rotary cultivated and potatoes planted (only 2
rows of plots 15, 19, 20): 10 Apr. Remaining two rows on plots 15,
19, 20 planted: 18 Apr. Linuron with paraquat applied: 12 May.
Grubbed: 6 June. Rotary ridged: 16 June. Fungicide with insecticide
applied: 5 July. Fungicide applied: 25 July, 13 Aug. Haulm
mechanically destroyed: 19 Sept. Lifted: 1 Oct. Previous crops:
Barley 1971, beans 1972.

NOTE: Tubers were graded into six sizes. Incidence of *Rhizoctonia solani*
and common scab were assessed after harvest.

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

Little Knott I (R): 4.66 or 10.7% (15 d.f.)

Horsepool (W): 1.88 or 5.0% (12 d.f.)

73/W/P/3 and 73/R/P/22

TABLES OF MEANS

LITTLE KNOTT I (R)

VARIETY

Desiree	Edward	Crown	Ivory	Entprise	Lancer	Mean
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TOTAL TUBERS: TONNES/HECTARE

39.8	48.6	50.7	39.0	41.6	42.2	43.6
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STANDARD ERROR OF DIFFERENCES

VARIETY

3.29

PERCENTAGE WARE: 4.44 CM (1.75 INCH) RIDDLE

82.0	82.3	95.4	82.6	89.0	80.2	85.2
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HORSEPOOL (W)

VARIETY

Piper	Crown	Ivory	Entprise	Lancer	Mean
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TOTAL TUBERS: TONNES/HECTARE

41.9	43.5	32.6	33.4	36.6	37.6
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STANDARD ERROR OF DIFFERENCES

VARIETY

1.33

PERCENTAGE WARE: 4.44 CM (1.75 INCH) RIDDLE

81.1	82.9	86.1	61.8	69.1	76.2
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73/R/P/4

POTATOES

SPACING AND FERTILISER

Object: To study the effects of different spacings within and between rows and of fertiliser rates on yields and size grades of two potato varieties - Stackyard.

Sponsors: G.A. Hide, J.R. Moffatt, F.V. Widdowson.

Design: 3 randomised blocks of 24 plots.

Whole plot dimensions: Narrow rows 2.84 x 15.2

Wide rows 3.66 x 15.2

Plot area harvested: Narrow rows 0.00217

Wide rows 0.00279

Treatments: All combinations of:

1. Varieties:

King Edward
Pentland Crown

VARIETY

Edward
Crown

2. Compound fertiliser (13:13:20) kg:

1510
3020

FERT

1510
3020

3. Row spacing cm:

71 (28 inches)
91 (36 inches)

ROWSPACE

71
91

4. Number of plants per hectare:

37100 (by spacing seed at 38 cm on rows 71 cm
apart, 30 cm on rows 91 cm apart)
29700 (seed 48 cm on 71 cm rows, 38 cm on 91
cm rows)
22200 (seed 61 cm on 71 cm rows, 48 cm on 91
cm rows)

PLANT/HA

37100
29700
22200

Basal applications: Weedkillers: Linuron at 1.2 kg with paraquat at 0.4 kg
ion in 450 l. Fungicide: Mancozeb at 1.3 kg in 430 l on narrow rows
and in 340 l on wide rows. Insecticide: Demeton-s-methyl at 0.25 kg
applied with the fungicide.

T3/R/P/4

Cultivations, etc.:— Ploughed: 4 Nov, 1972. Fertiliser treatments applied: 27 Mar, 1973. Rotary cultivated and seed planted: 18 Apr. Weedkiller applied: 18 May. Grubbed and ridged: 12 June. Insecticide with fungicide applied: 5 July. Fungicide applied: 24 July, 16 Aug. Sprayed with undiluted PCV at 220 l: 20 Sept. Lifted: 22 Oct. Previous crops: Wheat 1971, fallow 1972.

NOTE: Counts were made of plant and stem numbers after burning off and before lifting. Tubers were graded into 6 sizes.

Standard error per plot.

Total tubers, tonnes/hectare: 2.49 or 4.5% (46 d.f.)

73/R/P/4

3

TABLES OF MEANS

TOTAL TUBERS: TONNES/HECTARE

	FERT		ROWSPACE		PLANT/HA			Mean
	1510	3020	71	91	37100	29700	22200	
VARIETY								
Edward	48.9	50.9	51.9	47.9	49.9	50.6	49.2	49.9
Crown	58.6	64.0	62.9	59.7	62.6	60.6	60.6	61.3
	FERT							
		1510	55.3	52.2	55.0	53.1	53.1	53.8
		3020	59.5	55.3	57.5	58.1	56.7	57.4
		ROWSPACE						
				71	57.5	57.8	56.9	57.4
				91	55.0	53.4	52.9	53.8
Mean					56.3	55.6	54.9	55.6
		ROWSPACE		71		91		
		PLANT/HA	37100	29700	22200	37100	29700	22200
VARIETY	FERT							
Edward	1510	51.6	50.7	50.2	48.1	46.8	45.9	
Edward	3020	53.1	53.8	52.0	46.7	51.1	48.6	
Crown	1510	60.1	60.1	58.2	60.4	54.7	57.4	
Crown	3020	65.3	66.5	66.4	64.7	61.1	59.6	

T3/P/P/4

TOTAL TUBERS: TONNES/HECTARE

STANDARD ERRORS OF DIFFERENCES

VARIETY	FERT	ROW SPACE	PLANT/HA	VARIETY FERT	VARIETY ROW SPACE	FERT ROW SPACE
0.59	0.59	0.59	0.72	0.83	0.83	0.83
VARIETY PLANT/HA	FERT PLANT/HA	ROW SPACE PLANT/HA	VARIETY FERT ROW SPACE PLANT/HA			
1.02	1.02	1.02	2.03			

73/R/P/4

PERCENTAGE WARE: 4.44 CM (1.75 INCH) RIDDLE

VARIETY	FERT		ROWSPACE		PLANT/HA			Mean
	1510	3020	71	91	37100	29700	22200	
Edward Crown	74.9	78.2	76.5	76.5	73.6	76.2	79.6	76.5
	93.7	93.2	93.5	93.4	93.4	93.5	93.5	93.4
	FERT		ROWSPACE		PLANT/HA			Mean
		1510 3020	84.0 86.0	84.6 85.3	82.8 84.2	83.7 86.0	86.4 86.8	84.3 85.7
			ROWSPACE					Mean
			71 91		83.8 83.2	84.5 85.2	86.7 86.4	85.0 85.0
Mean					83.5	84.8	86.6	85.0

VARIETY	FERT	ROWSPACE			PLANT/HA		
		37100	29700	22200	37100	29700	22200
Edward	1510	71.0	72.9	78.9	73.2	74.3	78.8
Edward	3020	76.9	78.7	80.6	73.5	78.9	80.3
Crown	1510	93.5	93.3	94.3	93.4	94.3	93.6
Crown	3020	93.7	92.9	93.1	92.9	93.3	93.1

73/W/P/4

POTATOES

SOIL FUNGICIDES AND SCAB CONTROL

Object: To study the effects of a range of fungicides on yield and common scab of potatoes - Woburn Great Hill Bottom I.

Sponsor: A.H. McIntosh.

Design: 4 blocks of 5 plots.

Whole plot dimensions: 2.85 x 6.10. Area harvested: 0.00087.

Treatments: Fungicides (applied to soil at 78 kg):	FUNGICIDE
None	O
Catechol	CA
Chlorohydroquinone	CH
Hydroquinone	HY
Quintozene	QU

Basal applications: (13:13:20) at 1830 kg. Weedkiller: Linuron at 1.8 kg plus paraquat at 0.42 kg ion in 280 l. Fungicide with insecticide: Mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 390 l. Fungicide: Mancozeb at 1.3 kg in 390 l on the first occasion and 370 l on the second occasion.

Variety: Maris Piper.

Cultivations, etc.: - Deep-tine cultivated twice: 9 Oct, 1972, 16 Oct. NPK applied: 27 Mar, 1973. Treatment fungicide applied, all plots rotary cultivated, potatoes planted: 10 Apr. Weedkiller applied: 14 May. Fungicide with insecticide applied: 5 July. Fungicide applied: 26 July, 13 Aug. Haulm mechanically destroyed: 12 Sept. Lifted: 14 Sept. Previous crops: Barley 1971, beans 1972.

NOTE: Tuber samples were taken at harvest for assessment of scab.

Standard error per plot.

Total tubers, tonnes/hectare: 3.83 or 8.5% (12 d.f.)

73/W/P/4

2

TABLES OF MEANS

FUNGICIDE					Mean
O	CA	CH	HY	QU	
TOTAL TUBERS: TONNES/HECTARE					
45.4	44.4	44.2	41.8	49.6	45.1

STANDARD ERROR OF DIFFERENCES

FUNGICIDE

2.71

PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

95.9	95.5	95.2	94.9	96.1	95.5
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73/R/P/8

POTATOES

APHIDS AND TOP-ROLL

Object: To study the relationship between aphids and the appearance of top-roll in three potato varieties and to measure their effects on yields and quality of produce - Little Hoos.

Sponsor: R.W. Gibson.

Design: 4 randomised blocks of 9 plots.

Whole plot dimensions: 3.56 x 6.10. Area harvested: 0.00130.

Treatments: All combinations of:-

1. Aphid infestation

APHID

None, aphids controlled by insecticide - phorate
at 1.7 kg applied as granules at planting
Natural colonisation (2 plots/block)

None
Natural

2. Varieties

VARIETY

King Edward
Majestic
Pentland Crown

Edward
Majestic
Crown

Basal applications: Manures: (13:13:20) at 1500 kg. Weedkillers:
Linuron at 1.8 kg with paraquat at 0.8 kg ion in 430 l. Fungicide:
Mancozeb at 1.3 kg in 430 l.

Cultivations, etc.: - Deep-tine cultivated: 7 Aug, 1972, twice 22 Aug,
once 11 Sept. NPK applied: 23 Mar, 1973. Rotary cultivated: 16 Apr.
Ridged and hand planted: 17 Apr. Rotoridged: 27 Apr. Weedkiller
applied: 15 May. Fungicide applied 10, 25 July. Haulm mechanically
destroyed: 17 Sept. Sprayed with undiluted BOV at 220 l: 18 Sept.
Lifted: 12 Oct. Previous crops: Barley 1971, grass 1972.

NOTE: Aphid counts and assessments of top-roll were made at weekly
intervals during June and July.

Standard error per plot.

Total tubers, tonnes/hectare: 2.56 or 5.1% (27 d.f.)

73/R/P/8

TABLES OF MEANS

TOTAL TUBERS: TONNES/HECTARE

	VARIETY			Mean
	Edward	Majestic	Crown	
APHID				
None	50.0	52.4	46.5	49.6
Natural	47.9	51.8	49.4	49.7
Mean	48.6	52.0	48.4	49.7

STANDARD ERRORS OF DIFFERENCES

	APHID	VARIETY	APHID VARIETY
APHID	0.90	1.04	
None			1.81
Natural			1.28
None v Natural			1.56

PERCENTAGE WARE 4.44 CM (1.75 INCH) RIDDLE

	VARIETY			Mean
	Edward	Majestic	Crown	
APHID				
None	83.6	82.8	94.9	87.1
Natural	81.0	82.0	93.1	85.4
Mean	81.9	82.3	93.7	85.9