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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	Crown
King Edward, Little Hoos (R) only	Edward
Majestic	Majestic
Maris Piper, Horsepool (W) only	Piper
Record	Record
2. Seed health:	HEALTH
Once grown	Onegrown
Healthier	Healthy
Sub plots: 3. Fungicide to seed tubers:	FUNGICIDE
None	None
Benomyl	Benomyl
Sec-butylamine (0.28 l per tonne of seed)	Secbutyl
Thiabendazole	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).

73/R/P/1 and 73/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	Healthy	45.4	44.9	43.4	44.8	44.6
	Onegrown	Healthy	49.1	48.3	46.9	48.7	48.2
Mean			47.2	46.6	45.1	46.7	46.4

VARIETY	Onegrown				Healthy			
	None	Benomyl	Secbutyl	Thiabend	None	Benomyl	Secbutyl	Thiabend
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 HEALTH	VARIETY FUNGICIDE	HEALTH FUNGICIDE	VARIETY 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	Healthy	85.5	83.1	85.1	84.3	84.5
			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	Healthy	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	Healthy	31.7	33.7	33.4	32.8	32.9
			33.3	33.0	31.0	33.5	32.7
Mean			32.5	33.3	32.2	33.1	32.8

VARIETY	Onegrown				Healthy			
	None	Benomyl	Secbutyl	Thiabend	None	Benomyl	Secbutyl	Thiabend
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 HEALTH	VARIETY FUNGICIDE	HEALTH FUNGICIDE	VARIETY HEALTH FUNGICIDE
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	Healthy	84.4	83.2	82.5	83.1	83.3	
	Onegrown	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	Healthy	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: FUNGCIDE

None None

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

2. Aphicide: APHCIDE

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. NFK 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.)

73/R/P/2

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TABLES OF MEANS

TOTAL TREES: TONNES/HECTARE

FUNGICIDE	APHICIDE			VARIETY			Mean
	None	Daneton1	Daneton2	Edward	Majestic	Crown	
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		44.0	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

FUNGICIDE	APHICIDE			VARIETY					
	None	Daneton1		Edward		Majestic		Crown	
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						
				1.68		
					2.06	
						2.92

73/R/P/2

PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

FUNGICIDE	APHICIDE			VARIETY			Mean
	None	Demeton1	Demeton2	Edward	Majestic	Crown	
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

FUNGICIDE	APHICIDE			VARIETY			VARIETY		
	None	Demeton1		Demeton2			Edward	Majestic	Crown
	Edward	Majestic	Crown	Edward	Majestic	Crown	Edward	Majestic	Crown
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, BS1 and BS3 plots: 28 June. Fungicide with insecticide applied: 5 July. Additional foliar sprays applied to BS3 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

FORM	SPRAY						Mean
	O	TE	TEF	BS1	BS3	BD	
	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						Mean
	O	TE	TEF	BS1	BS3	BD	
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 burning 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	LIFTER 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

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

73/W/P/3 and 73/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:	VARIETY
King Edward	Edward
Pentland Crown	Crown
2. Compound fertiliser (13:13:20) kg:	FERT
1510	1510
3020	3020
3. Row spacing cm:	ROWSPACE
71 (28 inches)	71
91 (36 inches)	91
4. Number of plants per hectare:	PLANT/HA
37100 (by spacing seed at 38 cm on rows 71 cm apart, 30 cm on rows 91 cm apart)	37100
29700 (seed 48 cm on 71 cm rows, 38 cm on 91 cm rows)	29700
22200 (seed 61 cm on 71 cm rows, 48 cm on 91 cm rows)	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

VARIETY	FERT		ROWSPACE		PLANT/HA			Mean
	1510	3020	71	91	37100	29700	22200	
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	58.9	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	ROWSPACE	PLANT/HA	VARIETY FERT	VARIETY ROWSPACE	FERT ROWSPACE
0.59	0.59	0.59	0.72	0.83	0.83	0.83
VARIETY PLANT/HA	FERT PLANT/HA	ROWSPACE PLANT/HA	VARIETY FERT ROWSPACE 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	74.9	78.2	76.5	76.5	73.6	76.2	79.6	76.5
Crown	93.7	93.2	93.5	93.4	93.4	93.5	93.5	93.4
		FERT						
		1510	84.0	84.6	82.8	83.7	86.4	84.3
		3020	86.0	85.3	84.2	86.0	86.8	85.7
			ROWSPACE					
				71	83.8	84.5	86.7	85.0
				91	83.2	85.2	86.4	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					
O	CA	CH	HY	QU	Mean
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	None
Natural colonisation (2 plots/block)	Natural
2. Varieties	VARIETY
King Edward	Edward
Majestic	Majestic
Pentland Crown	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