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72/R/P/2 and 72/W/P/2 Potatoes Seed Stocks, Disease and Fungicides

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72/R/P/2 and 72/W/P/2

POTATOES

SEED STOCKS, DISEASES AND FUNGICIDES

Object: To study the effects of systemic fungicides and re-infection with *Oospora* and *Rhizoctonia* on potato stocks either freed from these diseases, by the use of stem cuttings, or not - Rothamsted (R) Great Knott I and Woburn (W) Horsepool Lane Close.

Sponsors: G.A. Hide, J.M. Hirst, F. Bell.

Design: 4 blocks of 12 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. Seed stocks, chitting, diseases, times of inoculation and fungicide (T):

F, FB, FC, FCB, H, HC, HCB, HCBP, HCOE, HCOL, HCRL, HCORL,

where F = Farm stock*.

H = Healthy seed (from stem cuttings).

B = Seed treated with fungicide (Benomyl 5% dust at 4.46 kg per tonne of seed).

P = Seed treated with fungicide (Plantvax 10% dust at 4.46 kg per tonne of seed).

C = Chitted seed.

O = Seed inoculated with *Oospora*.

R = Seed inoculated with *Rhizoctonia*.

E = Early inoculation.

L = Late inoculation.

Sub plots: 2. Varieties: Great Knott I (R): Pentland Crown (PC), King Edward (KE), Majestic (M), Record (R). Horsepool Lane Close (W): Pentland Crown (PC), Majestic (M), Maris Piper (MP), Record (R).

* Rothamsted once grown for Pentland Crown and King Edward. Scottish FS for Majestic, Record and Maris Piper.

Basal applications:-

Great Knott I (R): 1510 kg (13:13:20). Weedkiller: Linuron at 0.8 kg with paraquat at 0.4 kg ion in 440 l. Fungicide: Mancozeb at 1.3 kg in 440 l. Fungicide with insecticide: Mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 440 l.

Horsepool Lane Close (W): 1510 kg (13:13:20). Weedkiller: Linuron at 1.1 kg with paraquat at 0.4 kg ion in 370 l. Paraquat at 0.4 kg ion in 280 l. Fungicide: Mancozeb at 1.3 kg in 430 l. Fungicide with insecticide: Mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 430 l.

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Cultivations, etc.:-

Great Knott I (R): Ploughed: 5 - 11 Nov, 1971. NPK applied: 22 Apr, 1972. Rotary cultivated, potatoes planted: 25 - 26 Apr. Weedkiller applied: 18 May. Fungicide applied on three occasions: 11 July, 24 July, 10 Aug. Insecticide with fungicide applied on one occasion: 24 July. Sprayed with undiluted BOV at 200 l: 20 Sept. Lifted: 10 Oct. Previous crops: Barley 1970, fallow 1971.

Horsepool Lane Close (W): Deep-tine cultivated: 3 Nov, 1971. NPK applied: 30 Mar, 1972. Rotary cultivated: 24 Apr. Potatoes planted: 25 Apr. Linuron with paraquat applied: 11 May. Paraquat applied to 5 rows missed at the first application of weedkiller: 1 June. Fungicide applied: 6 July. Fungicide with insecticide applied: 27 July. Sprayed with undiluted BOV at 200 l: 25 Sept. Haulm mechanically destroyed: 28 Sept. Lifted: 9 - 11 Oct. Previous crops: Spring wheat 1970, fallow 1971.

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

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

Great Knott I (R):	Whole plot: 2.79 or 6.1% (33 d.f.)
	Sub plot: 2.91 or 6.4% (108 d.f.)
Horsepool Lane Close (W):	Whole plot: 3.75 or 7.6% (33 d.f.)
	Sub plot: 3.37 or 6.8% (108 d.f.)

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TABLES OF MEANS

GREAT KNOTT I (R)

VARIETY

	KE	M	PC	R	Mean
T	TOTAL TUBERS: TONNES/HECTARE				
F	39.9	41.2	47.1	32.3	40.1
FB	41.5	47.3	47.2	35.5	42.9
FC	49.1	50.4	54.3	36.6	47.6
FCB	50.8	48.9	54.2	39.8	48.4
H	46.1	48.3	48.2	37.0	44.9
HC	46.5	51.6	52.9	36.1	46.8
HCB	45.3	51.7	47.0	35.3	44.8
HCBP	45.5	53.7	51.6	38.6	47.4
HCOE	46.9	53.5	51.1	35.9	46.9
HCOL	42.9	53.0	50.9	35.5	45.6
HCRL	44.8	52.4	49.9	35.7	45.7
HCORL	46.5	52.0	53.7	38.5	47.7
Mean	45.5	50.3	50.7	36.4	45.7

STANDARD ERRORS OF DIFFERENCES

	T	VARIETY	T VARIETY
Unless same level of T	1.97	0.59	2.66 2.06

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GREAT KNOTT I (R)

VARIETY

	KE	M	PC	R	Mean
T	PERCENTAGE WARE: 4.44 CM (1.75 INCH) RIDDLE				
F	59.8	80.8	83.1	73.5	74.3
FB	40.9	79.3	78.9	64.1	65.8
FC	63.6	77.1	85.7	76.8	75.8
FCB	58.6	81.9	82.4	73.7	74.2
H	58.6	76.9	85.2	76.0	74.2
HC	63.0	77.1	85.2	72.3	74.4
HCB	50.1	72.9	83.4	73.6	70.0
HCBP	54.8	73.4	84.5	69.1	70.5
HCOE	62.2	77.6	83.7	67.1	72.7
HCOL	65.8	77.6	86.2	74.0	75.9
HCRL	58.6	72.5	84.0	69.4	71.1
HCORL	68.0	76.9	85.4	75.5	76.5
Mean	58.7	77.0	84.0	72.1	72.9

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HORSEPOOL LANE CLOSE (W)

VARIETY

	M	MP	PC	R	Mean
T	TOTAL TUBERS: TONNES/HECTARE				
F	45.7	38.5	48.4	36.8	42.4
FB	53.8	42.4	50.4	42.2	47.2
FC	49.3	45.7	56.8	41.8	48.4
FCB	49.5	47.2	57.3	40.9	48.7
H	53.1	46.8	55.0	45.2	50.0
HC	56.5	45.3	53.3	37.1	48.0
HCB	63.2	47.9	58.0	42.5	52.9
HCBP	59.5	51.3	57.9	40.3	52.2
HCOE	62.5	50.3	58.8	42.8	53.6
HCOL	56.9	47.1	55.2	40.2	49.8
HCRL	55.9	47.7	57.3	40.1	50.2
HCORL	56.1	47.6	55.7	41.1	50.1
Mean	55.2	46.5	55.3	40.9	49.5

STANDARD ERRORS OF DIFFERENCES

	T	VARIETY	T VARIETY
Unless same level of T	2.65	0.69	3.36 2.38

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HORSEPOOL LANE CLOSE (W)

	VARIETY				Mean
	M	MP	PC	R	
T	PERCENTAGE WARE: 4.44 CM (1.75 INCH) RIDDLE				
F	77.3	60.1	82.2	75.8	73.8
FB	77.5	50.6	76.9	68.5	68.4
FC	75.3	69.7	86.1	77.0	77.0
FCB	76.3	68.9	80.2	73.2	74.7
H	79.1	58.3	88.9	82.0	77.1
HC	69.8	50.5	87.0	58.9	66.6
HCB	79.8	60.1	84.5	68.5	73.2
HCBP	77.8	58.1	86.5	70.1	73.1
HCOE	79.1	62.6	82.5	69.2	73.4
HCOL	73.1	59.2	87.3	68.2	72.0
HCRL	71.1	55.4	86.7	61.8	68.8
HCORL	78.5	69.4	88.9	75.4	78.0
Mean	76.2	60.2	84.8	70.7	73.0