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74/R/P/2 and 74/W/P/2 Seed Stocks and Seed Treatment - Potatoes

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74/R/P/2 and 74/W/P/2

POTATOES

SEED STOCKS AND SEED TREATMENT

Object: To study the effects of treating tubers with systemic fungicides or a fumigant on tuber-borne diseases and yield of potatoes - Rothamsted (R) Pastures and Woburn (W) Lansome III.

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

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

Whole plot dimensions: 5.69 x 9.53. Area harvested: 0.00135.

Treatments: All combinations of:-

Whole plots: 1. Varieties

VARIETY

King Edward, Pastures (R) only	Edward
Maris Piper, Lansome III (W) only	Piper
Majestic	Majestic
Pentland Crown	Crown
Record	Record

2. Seed health

HEALTH

ex FS, once-grown at Rothamsted in 1973	FS
ex VTSC, once-grown at Rothamsted in 1973	VTSC

Sub plots: 3. Fungicide to seed tubers

FUNGICIDE

None	None
Benomyl	Benomyl
Sec-butylamine	Secbutyl
Thiabendazole	Thiabend

Basal applications:

Pastures (R): Manures: (13:13:20) at 1510 kg. Weedkillers: Linuron at 1.2 kg plus paraquat at 0.42 kg ion in 450 l. Fungicide with insecticide: Mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 450 l. Fungicide: Mancozeb at 1.3 kg in 450 l.

Lansome III (W): Manures: (13:13:20) at 1880 kg. Weedkillers: Linuron at 1.2 kg plus paraquat at 0.28 kg ion in 280 l. Fungicide with insecticide: Mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 450 l. Fungicide: Mancozeb at 1.3 kg in 450 l.

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Cultivations, etc.:-

Pastures (R): Ploughed: 23 Nov, 1973. Spring-tine cultivated: 17 Apr, 1974. NPK applied, spike rotary cultivated, potatoes planted: 24 Apr. Weedkiller applied: 21 May. Fungicide with insecticide applied: 12 July. Fungicide applied: 2 Aug. Haulm mechanically destroyed: 10 Sept. Sprayed with undiluted BOV at 220 l: 16 Sept. Lifted: 1 Nov. Previous crops: Barley 1972, spring beans 1973.

Lansome III (W): Subsoiled, tines 140 cm apart, 50 cm deep: 12-14 Nov, 1973. Ploughed: 14 Dec. Spring-tine cultivated: 10 Apr, 1974. NPK applied: 16 Apr. Rotary cultivated: 18 Apr. Potatoes planted: 19 Apr. Weedkiller applied: 16 May. Fungicide with insecticide applied: 18 July. Fungicide applied: 7 Aug. Haulm mechanically destroyed: 12 Sept. Sprayed with undiluted BOV at 170 l: 18 Sept. Lifted: 22 Oct. Previous crops: Barley 1972, beans 1973.

- NOTES: (1) Counts were made of plant and stem numbers after burning off and before lifting.
(2) Crop samples were taken on June 1, June 30 and Sept 4 for tuber weight, size and estimates of infection.
(3) At harvest tubers were graded into 6 sizes and assessments made of *Oospora*, *Rhizoctonia*, *Helminthosporium* and *Phoma* infection.

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

Pastures (R).	Whole plot: 1.57 or 2.7% (21 d.f.)
	Sub plot: 3.85 or 6.8% (72 d.f.)
Lansome III (W).	Whole plot: 3.59 or 6.8% (21 d.f.)
	Sub plot: 4.22 or 8.0% (72 d.f.)

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TABLES OF MEANS

PASTURES (R)

TOTAL TUBERS: TONNES/HECTARE

	FUNGICIDE				VARIETY				Mean
	None	Benomyl	Secbutyl	Thiabend	Edward	Majestic	Crown	Record	
HEALTH									
FS	54.5	54.7	54.6	55.1	54.2	57.1	61.5	46.2	54.7
VTSC	60.3	59.3	59.0	59.1	62.2	63.6	64.2	47.7	59.4
			FUNGICIDE						
			None		56.0	59.6	65.1	48.8	57.4
			Benomyl		59.2	61.0	62.9	44.9	57.0
			Secbutyl		59.6	61.6	60.9	45.0	56.8
			Thiabend		57.9	59.1	62.6	48.9	57.1
Mean					58.2	60.3	62.9	46.9	57.1
HEALTH			FS				VTSC		
FUNGICIDE		None	Benomyl	Secbutyl	Thiabend	None	Benomyl	Secbutyl	Thiabend
VARIETY									
Edward		53.9	57.1	55.0	50.6	58.1	61.3	64.2	65.1
Majestic		56.5	56.7	59.7	55.3	62.7	65.3	63.5	62.9
Crown		61.5	60.1	60.5	64.0	68.7	65.8	61.3	61.1
Record		46.0	45.0	43.2	50.5	51.7	44.8	46.8	47.4

STANDARD ERRORS OF DIFFERENCES

HEALTH	FUNGICIDE	VARIETY	HEALTH FUNGICIDE	HEALTH VARIETY	FUNGICIDE VARIETY	VARIETY HEALTH FUNGICIDE
0.55	0.96	0.78	1.30	1.11	1.84	2.61
Except when comparing means with same levels of						
HEALTH			1.36			
VARIETY					1.93	
VARIETY.HEALTH						2.73

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PASTURES (R)

PERCENTAGE WARE: 4.44 CM (1.75 INCH) RIDDLE

	FUNGICIDE				VARIETY				Mean
	None	Benomyl	Secbutyl	Thiabend	Edward	Majestic	Crown	Record	
HEALTH									
FS	87.2	87.0	86.9	86.1	80.1	84.3	95.7	87.1	86.8
VTSC	86.9	86.6	87.2	86.8	79.3	82.4	95.7	90.1	86.9
			FUNGICIDE						
			None		81.7	83.4	95.4	87.5	87.0
			Benomyl		79.9	82.7	96.0	88.6	86.8
			Secbutyl		79.1	84.5	95.7	88.9	87.1
			Thiabend		78.2	82.7	95.7	89.3	86.5
Mean					79.7	83.3	95.7	88.6	86.8

HEALTH FUNGICIDE	FS				VTSC			
	None	Benomyl	Secbutyl	Thiabend	None	Benomyl	Secbutyl	Thiabend
VARIETY								
Edward	83.7	81.1	77.7	77.8	79.8	78.7	80.4	78.5
Majestic	83.9	85.0	86.0	82.3	83.0	80.4	83.0	83.0
Crown	95.3	96.1	95.7	95.7	95.5	95.9	95.7	95.7
Record	85.7	85.9	88.0	88.8	89.4	91.3	89.8	89.9

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LANSOME III (W)

TOTAL TUBERS: TONNES/HECTARE

	FUNGICIDE				VARIETY				Mean
	None	Benomyl	Secbutyl	Thiabend	Piper	Majestic	Crown	Record	
HEALTH									
FS	52.7	52.6	51.3	54.4	58.2	56.1	58.7	37.9	52.7
VTSC	52.5	54.6	52.1	52.7	57.9	59.2	53.5	41.2	53.0
			FUNGICIDE						
			None		56.4	58.1	54.7	41.0	52.6
			Benomyl		58.0	56.7	58.2	41.4	53.6
			Secbutyl		59.0	56.0	53.7	38.1	51.7
			Thiabend		58.9	59.8	57.8	37.8	53.6
Mean					58.1	57.7	56.1	39.6	52.8
HEALTH			FS				VTSC		
FUNGICIDE			None Benomyl Secbutyl Thiabend				None Benomyl Secbutyl Thiabend		
VARIETY									
Piper			57.8 58.0 57.5 59.7		55.1	58.1	60.5	58.1	
Majestic			55.2 53.0 56.7 59.7		61.1	60.4	55.4	59.9	
Crown			57.7 59.1 56.0 61.9		51.7	57.2	51.3	53.8	
Record			40.0 40.1 35.0 36.4		41.9	42.7	41.2	39.2	

STANDARD ERRORS OF DIFFERENCES

HEALTH	FUNGICIDE	VARIETY	HEALTH FUNGICIDE	HEALTH VARIETY	FUNGICIDE VARIETY	VARIETY HEALTH FUNGICIDE
1.27	1.05	1.80	1.81	2.54	2.56	3.62
Except when comparing means with same levels of						
HEALTH			1.49			
VARIETY					2.11	
VARIETY. HEALTH						2.98

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LANSCOME III (W)

PERCENTAGE WARE: 4.44 CM (1.75 INCH) RIDDLE

	FUNGICIDE				VARIETY				
	None	Benomyl	Secbutyl	Thiabend	Piper	Majestic	Crown	Record	Mean
HEALTH									
FS	83.0	82.4	80.0	79.8	76.4	80.9	95.1	72.8	81.3
VTSC	77.9	78.2	77.7	78.1	71.9	74.0	92.6	73.4	78.0
			FUNGICIDE						
			None		76.5	76.7	93.0	75.6	80.5
			Benomyl		76.6	78.0	93.9	72.7	80.3
			Secbutyl		72.7	78.2	94.5	69.9	78.8
			Thiabend		70.8	76.9	93.9	74.2	79.0
Mean					74.2	77.4	93.9	73.1	79.6
HEALTH	FS				VTSC				
FUNGICIDE	None	Benomyl	Secbutyl	Thiabend	None	Benomyl	Secbutyl	Thiabend	
VARIETY									
Piper	80.5	78.8	73.2	73.2	72.5	74.5	72.2	68.3	
Majestic	81.2	79.8	83.0	79.8	72.1	76.2	73.5	74.0	
Crown	94.0	95.8	95.6	95.0	92.1	92.1	93.5	92.9	
Record	76.4	75.4	68.2	71.1	74.9	70.0	71.5	77.3	