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71/W/P/1 Seed Stocks, Diseases and Fungicides - Potatoes

Rothamsted Research

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71/W/P/1

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. Varieties and the effects of chitting are also studied - Woburn Great Hill II.

Design: 4 blocks of 3 plots split into 12 (plus one extra block for sampling).

Whole plot dimensions: 5.69 x 37.7. Sub plot area harvested: 0.00135.

Treatments: All combinations of:-

Whole plots: 1. Varieties: Majestic (M), Pentland Crown (PC), Record (R).

Twelfth plots: 2. Seed stocks, chitting, diseases, times of inoculation and fungicides:

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

where F = Once grown seed Rothamsted grown*.

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.

* For Record an 'A' stock was used.

Basal applications: 1883 kg (13:13:20). Weedkiller: Linuron at 1.12 kg in 371 l. Fungicide with insecticide: Mancozeb at 1.34 kg plus demeton-s-methyl at 245 g in 416 l. Fungicide: Mancozeb at 1.34 kg in 371 l.

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Cultivations, etc.: Ploughed: 10 - 11 Nov, 1970. NPK applied, rotary cultivated: 6 Apr, 1971. Potatoes planted: 7 Apr. Weedkiller applied: 5 May. Rotary ridged: 1 June. Fungicide with insecticide applied: 29 June. Fungicide applied: 13 Aug. Sprayed with undiluted BOV at 225 l: 20 Sept. Lifted: 29 Sept. Previous crops: Barley 1969, fallow 1970.

NOTE: Samples were taken throughout the season from the sample blocks for tuber weights and numbers of different sizes. After harvest estimates were made of tuber infection with *Oospora*, *Rhizoctonia*, *Helminthosporium* and *Phoma*.

Standard errors per plot. Total tubers, tonnes/hectare:
Whole plot: 2.56 or 5.6% (6 d.f.)
Sub plot: 4.27 or 9.3% (99 d.f.)

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SUMMARY OF RESULTS

	M	PC	R	Mean
TOTAL TUBERS: TONNES/HECTARE				
	(1) and (2)			(±1.23)
F	49.0	45.4	26.7	40.4
FB	45.7	45.0	32.3	41.0
FC	55.2	43.9	32.2	43.8
FCB	55.9	56.2	34.0	48.7
H	48.6	40.3	34.6	41.2
HC	61.6	52.0	39.8	51.2
HCB	59.7	54.7	40.6	51.6
HCBP	60.4	54.7	38.6	51.3
HCOE	57.5	47.6	38.1	47.7
HCOL	60.1	48.1	37.9	48.7
HCRL	54.8	41.2	35.4	43.8
HCORL	52.9	40.9	34.5	42.8
Mean (±1.28)	55.1	47.5	35.4	46.0

(1) (±2.41) For use in horizontal and diagonal comparisons only

(2) (±2.14) For use in vertical and interaction comparisons only

¾ WARE: 4.44 CM (1.75 INCH) RIDDLE

F	73.1	75.4	66.4	71.6
FB	64.9	72.7	72.2	70.0
FC	75.5	78.8	72.3	75.5
FCB	71.1	80.5	65.4	72.3
H	65.4	67.9	47.3	60.2
HC	74.2	83.5	64.1	73.9
HCB	75.5	81.0	66.6	74.3
HCBP	73.2	79.7	63.8	72.3
HCOE	74.6	78.5	66.1	73.1
HCOL	76.1	78.4	68.5	74.3
HCRL	77.7	74.1	70.7	74.2
HCORL	78.3	72.5	64.6	71.8
Mean	73.3	76.9	65.7	72.0