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78/R/P/1 and 78/W/P/1 Fungicides and Rhizoctonia - Potatoes

Rothamsted Research

Rothamsted Research (1979) *78/R/P/1 and 78/W/P/1 Fungicides and Rhizoctonia - Potatoes* ; Yields Of The Field Experiments 1978, pp 432 - 435 - DOI: <https://doi.org/10.23637/ERADOC-1-30>

78/R/P/1 and 78/W/P/1

POTATOES

FUNGICIDES AND RHIZOCTONIA

Object: To study the effects of different methods of applying a range of fungicides on the incidence of Rhizoctonia and on the yield of potatoes - Rothamsted (R) Fosters Corner and Woburn (W) Horsepool Lane Close E.

Sponsors: G.A. Hide, G.R. Cayley.

Design: 3 randomised blocks of 3 plots split into 12.

Whole plot dimensions: 5.69 x 28.6.

Treatments: All combinations of:-

Whole plots

- | | |
|-------------|--|
| 1. INOCULUM | Source of Rhizoctonia inoculum: |
| 0 | None applied to soil and none on seed tubers |
| SEED RH | None applied to soil, seed tubers with Rhizoctonia |
| SOIL RH | Rhizoctonia applied to soil, none on seed tubers |

Sub plots

- | | |
|-------------|--|
| 2. FUNGCIDE | Fungicides and methods of application: |
| 0 | None |
| SE BEN | Seed treated with benodanil |
| SE IPR | " " " iprodione |
| SE MAN | " " " maneb |
| SE THI | " " " thiabendazole |
| SP BEN | Sprouts dusted with benodanil |
| SP IPR | " " " iprodione |
| SP MAN | " " " maneb |
| SP THI | " " " thiabendazole |
| SO BEN | Soil treated with benodanil |
| SO IPR | " " " iprodione |
| SO THI | " " " thiabendazole |

- NOTES: (1) Treatments to seed tubers were applied as 5% dusts at 0.23 kg a.i. per tonne of seed before planting.
(2) Treatments to sprouts were applied by dipping seed in 5% dusts pre-planting.
(3) Treatments to soil were applied as 5% dusts, at 11.2 kg a.i., broadcast on the soil surface and worked in just before planting.

Basal applications:

Fosters Corner (R): Manures: (13:13:20) at 1510 kg. Weedkillers: Linuron at 1.3 kg with paraquat at 0.42 kg ion in 220 l. Fungicides: Mancozeb at 1.3 kg in 220 l on three occasions, with insecticide on the second and third. Fentin acetate and maneb (as 'Fennite A' at 1.7 kg in 220 l) on two occasions. Insecticide: Pirimicarb at 0.14 kg. Haulm desiccant: Undiluted BOV at 170 l.

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Horsepool Lane Close E (W): Manures: (13:13:20) at 1760 kg. Weedkillers: Linuron at 1.3 kg with paraquat at 0.14 kg ion in 280 l. Fungicide: Mancozeb at 1.3 kg on three occasions, on the first and second in 280 l and on the third with insecticide in 420 l. Fentin acetate with maneb (as 'Fennite A' at 1.7 kg in 280 l). Insecticide: Pirimicarb at 0.14 kg. Haulm desiccant: Undiluted BOV at 170 l.

Seed: Pentland Crown at both sites.

Cultivations, etc.:-

Fosters Corner: Ploughed: 9 Nov, 1977. Heavy spring-tine cultivated: 5 Apr, 1978. NPK applied: 24 Apr. Rhizoctonia inoculum and fungicide treatments applied, spike rotary cultivated, ridged, potatoes planted, split back: 25 Apr. Grubbed: 17 May. Rotary ridged: 19 May. Weedkillers applied: 22 May. Mancozeb applied: 5 July, 18 July, 4 Aug. Insecticide applied with mancozeb: 18 July, 4 Aug. Fentin acetate with maneb applied: 18 Aug, 8 Sept. Haulm desiccant applied: 2 Oct. Lifted: 18 Oct. Previous crops: Barley 1976, beans 1977.

Horsepool Lane Close E (W): Heavy spring-tine cultivated twice: 22 Sept, 1977. Ploughed: 5 Dec. NPK applied: 4 Apr, 1978. Deep-tine cultivated: 5 Apr. Rhizoctonia inoculum applied to the soil: 27 Apr. Fungicide treatments applied, rotary cultivated, ridged up, potatoes planted: 5 May. Split back: 8 May. Grubbed, earthed up: 11 May. Weedkiller applied: 26 May. Grubbed: 12 June. Earthed up: 13 June. Mancozeb applied: 6 July, 21 July, 11 Aug. Insecticide applied with mancozeb: 11 Aug. Fentin acetate with maneb applied: 23 Aug. Haulm desiccant applied: 23 Sept. Lifted: 10 Oct. Previous crops: Barley 1976, W. oats 1977.

NOTES: (1) Emergence counts were made in May.

(2) Plant samples were taken in July for estimates of corticium (White hose) at the base of the stem.

(3) Plant samples were taken in July and September for estimates of incidence of stem canker and stolon pruning and for yield.

(4) After harvest and grading samples were taken for estimates of infection by black scurf.

(5) At Woburn yields from 3 plots were lost with the following treatment combinations

INOCULUM	SOIL RH	O	O
FUNGICIDE	SP MAN	SO BEN	SO THI

(6) At Woburn on one occasion the spraying tractor was driven along one set of sub-plots, not in the 'spray-paths' as was intended. Effects of damage to the haulm have been estimated by covariance and adjusted yields etc. are presented.

78/R/P/1 FOSTERS CORNER

TOTAL TUBERS TONNES/HECTARE

***** TABLES OF MEANS *****

INOCULUM FUNGCIDE	0	SEED RH	SOIL RH	MEAN
0	45.2	46.7	45.5	45.8
SE BEN	48.6	45.9	46.7	47.1
SE IPR	44.7	49.9	43.3	46.0
SE MAN	46.9	48.9	46.6	47.5
SE THI	45.8	50.4	46.4	47.5
SP BEN	44.3	48.5	45.6	46.1
SP IPR	46.1	49.1	43.3	46.2
SP MAN	48.4	49.1	44.9	47.5
SP THI	46.7	47.7	45.6	46.7
SO BEN	44.3	44.3	46.4	45.0
SO IPR	48.1	46.1	47.3	47.2
SO THI	44.3	47.6	46.7	46.2
MEAN	46.1	47.9	45.7	46.6

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	INOCULUM	FUNGCIDE	INOCULUM FUNGCIDE
SED	0.91	0.97	1.86
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: INOCULUM			1.69

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	4	1.12	2.4
BLOCK.WP.SP	66	2.07	4.4

PERCENTAGE WARE 4.44CM (1.75 INCH) RIDDLE

***** TABLES OF MEANS *****

INOCULUM FUNGCIDE	0	SEED RH	SOIL RH	MEAN
0	85.6	86.0	84.0	85.2
SE BEN	85.8	86.9	86.5	86.4
SE IPR	81.9	83.4	82.3	82.5
SE MAN	85.3	85.6	85.9	85.6
SE THI	85.6	89.1	88.2	87.6
SP BEN	87.9	87.0	84.8	86.6
SP IPR	83.5	86.1	83.8	84.5
SP MAN	88.8	87.3	87.3	87.8
SP THI	87.5	88.0	85.6	87.0
SO BEN	88.9	88.2	89.1	88.7
SO IPR	82.1	87.0	85.1	84.8
SO THI	88.8	90.2	87.3	88.8
MEAN	86.0	87.1	85.8	86.3

SUB PLOT AREA HARVESTED 0.00084

78/W/P/1 HORSEPOOL LANE CLOSE E

TOTAL TUBERS TONNES/HECTARE

***** TABLES OF MEANS *****

INOCULUM FUNGICIDE	0	SEED RH	SOIL RH	MEAN
0	47.8	45.1	40.4	44.4
SE BEN	46.6	39.9	45.7	44.0
SE IPR	47.6	46.7	44.2	46.2
SE MAN	47.4	45.9	44.7	46.0
SE THI	43.4	45.0	41.8	43.4
SP BEN	40.1	47.1	45.1	44.1
SP IPR	46.3	44.8	44.8	45.3
SP MAN	47.5	45.8	37.6	43.6
SP THI	47.2	45.6	46.1	46.3
SO BEN	46.0	46.7	44.6	45.8
SO IPR	43.8	46.4	44.4	44.9
SO THI	43.6	46.4	46.3	45.4
MEAN	45.6	45.5	43.8	45.0

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	INOCULUM	FUNGICIDE	INOCULUM FUNGICIDE
SED	0.93	1.67	2.91
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
INOCULUM			2.94

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	4	0.90	2.0
BLOCK.WP.SP	61	3.49	7.8

PERCENTAGE WARE 4.44CM (1.75 INCH) RIDDLE

***** TABLES OF MEANS *****

INOCULUM FUNGICIDE	0	SEED RH	SOIL RH	MEAN
0	86.9	90.7	85.6	87.7
SE BEN	87.3	89.8	86.2	87.8
SE IPR	83.9	80.1	82.4	82.2
SE MAN	89.6	89.0	86.5	88.3
SE THI	88.9	88.0	87.6	88.2
SP BEN	87.2	87.5	86.8	87.1
SP IPR	82.7	87.2	84.5	84.8
SP MAN	89.6	92.1	89.2	90.3
SP THI	86.9	88.9	87.2	87.6
SO BEN	89.2	87.0	87.8	88.0
SO IPR	84.7	82.9	78.1	81.9
SO THI	86.0	89.9	86.6	87.5
MEAN	86.9	87.8	85.7	86.8
SUB PLOT AREA HARVESTED		0.00081		