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90/R/P/1 and 90/W/P/1 Fungicides With the Seed - Potatoes

Rothamsted Research

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90/R/P/1 and 90/W/P/1

POTATOES

FUNGICIDES WITH THE SEED

Object: To study the effects of fungicides applied with the seed at planting on the yield and tuber diseases of potatoes - Rothamsted, Fosters West (R), Woburn, Butt Furlong (W).

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

Design: 2 randomised blocks of 18 plots.

Whole plot dimensions: 1.5 x 6.0.

Treatments: All combinations of:-

1. **VARIETY** Varieties:

DESIREE
ESTIMA
MARFONA

2. **SOILFUNG** Fungicides, per t of seed, applied in the ridge at planting:

THIA+IMA Thiabendazole at 30 g plus imazalil at 10 g
TOLC MET Tolclofos methyl at 250 g

3. **FUNGMETH** Methods of applying fungicides:

PLANTING At planting
SEEDRESS As a seed application prior to planting

plus three extra treatments:

EXTRA

DES NONE Desiree not given fungicides to the seed (duplicated)
EST NONE Estima not given fungicides to the seed (duplicated)
MAR NONE Marfona not given fungicides to the seed (duplicated)

NOTES: (1) **SOILFUNG** applications were made with a powder applicator placing the fungicide alongside the potatoes at planting.
(2) **SEEDRESS** treatments were applied to tubers by electrostatic sprayer in 0.44 l of water per tonne of seed on 21 Feb, 1990 to Estima and Desiree, 9 Mar to Marfona.

Basal applications:

Fosters West (R): Manures: FYM at 41 t. (13:13:21) at 1.5 t.
Weedkillers: Glyphosate at 1.4 kg in 200 l. Linuron at 1.6 kg in 200 l. Fungicides: Maneb at 0.96 kg and zinc oxide at 0.022 kg in 200 l applied on two occasions, with the insecticide on the first and with a wetting agent, 'Bond' at 200 ml, on the second.
Mancozeb at 1.0 kg in 200 l applied on two occasions. Fentin hydroxide at 0.27 kg in 200 l. Insecticide: Pirimicarb at 0.14 kg. Irrigation: 25 mm applied on each of four occasions.
Desiccant: BOV at 280 l.

90/R/P/1 and 90/W/P/1

Basal applications:

Butt Furlong (W): Manures: (0:18:36) at 690 kg. (13:13:20) at 1.6 t.
Weedkiller: Linuron at 1.6 kg in 220 l. Fungicide: Mancozeb at 1.0 kg with a wetting agent, 'Bond' at 200 ml, in 220 l, applied on two occasions. Mancozeb at 1.4 kg, with 'Bond' at 200 ml, in 220 l. Fentin hydroxide at 0.27 kg applied on three occasions in 220 l. Nematicide: Oxamyl at 5.5 kg. Irrigation: 12 mm applied on each of ten occasions. Desiccant: BOV at 220 l.

Cultivations, etc.:-

Fosters West (R): Glyphosate applied: 26 Sept, 1989. FYM applied: 15 Nov. Ploughed: 23 Nov. NPK applied: 19 Mar, 1990. Spring-tine cultivated, rotary harrowed, potatoes planted and rotary ridged: 4 Apr. Linuron applied: 5 Apr. Irrigation applied: 6, 26 June, 16 July and 1 Aug. Maneb, zinc oxide and pirimicarb applied: 15 June. Mancozeb applied: 29 June and 13 July. Maneb, zinc oxide and wetting agent applied: 27 July. Fentin hydroxide applied: 13 Aug. Haulm mechanically destroyed: 23 Aug. Desiccant applied: 28 Aug. Potatoes lifted: 24 Oct. Previous crops: S. wheat 1988, w. oats 1989.

Butt Furlong (W): PK applied: 2 Sept, 1989. Subsoiled with tines 150 cm apart and 45 cm deep: 11 Sept. Ploughed: 16 Nov. Nematicide applied, NPK applied, spring-tine cultivated and seed planted: 11 Apr, 1990. Weedkiller applied: 19 Apr. Mancozeb at lower rate with wetting agent applied: 26 June and 11 July and at higher rate: 24 July. Irrigation applied: 27, 29 June, 2, 11, 17, 20, 23 July, 3, 6 and 10 Aug. Fentin hydroxide applied: 7, 21 Aug and 10 Sept. Haulm mechanically destroyed: 12 Sept. Desiccant applied: 17 Sept. Potatoes lifted: 19 Oct. Previous crops: S. barley 1988 and 1989.

NOTE: Tuber diseases were assessed after harvest.

90/R/P/1 FOSTERS WEST (R)

TOTAL TUBERS TONNES/HECTARE

***** Tables of means *****

SOILFUNG VARIETY	THIA+IMA	TOLC MET	Mean
DESIREE	40.1	41.9	41.0
ESTIMA	44.0	43.2	43.6
MARFONA	44.0	48.7	46.4
Mean	42.7	44.6	43.7

FUNGMETH VARIETY	PLANTING	SEEDRESS	Mean
DESIREE	41.2	40.9	41.0
ESTIMA	42.8	44.4	43.6
MARFONA	47.8	44.9	46.4
Mean	43.9	43.4	43.7

FUNGMETH SOILFUNG	PLANTING	SEEDRESS	Mean
THIA+IMA	42.4	43.0	42.7
TOLC MET	45.4	43.8	44.6
Mean	43.9	43.4	43.7

VARIETY	SOILFUNG THIA+IMA	SEEDRESS	TOLC MET PLANTING	SEEDRESS
DESIREE	38.9	41.4	43.5	40.3
ESTIMA	42.4	45.6	43.2	43.1
MARFONA	45.9	42.1	49.7	47.8

EXTRA	DES NONE	EST NONE	MAR NONE	Mean
	45.2	46.5	45.8	45.8

GRAND MEAN 44.4

*** Standard errors of differences of means ***

VARIETY	SOILFUNG	FUNGMETH	VARIETY SOILFUNG
2.51	2.05	2.05	3.55

VARIETY FUNGMETH	SOILFUNG FUNGMETH	VARIETY SOILFUNG FUNGMETH	EXTRA
3.55	2.90	5.02	3.55

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	20	5.02	11.3

90/R/P/1 FOSTERS WEST (R)

PERCENTAGE WARE 3.81CM (1.5 INCH) RIDDLE

***** Tables of means *****

SOILFUNG VARIETY	THIA+IMA	TOLC MET	Mean
DESIREE	95.5	96.1	95.8
ESTIMA	94.8	96.2	95.5
MARFONA	97.7	97.5	97.6
Mean	96.0	96.6	96.3

FUNGMETH VARIETY	PLANTING	SEEDRESS	Mean
DESIREE	96.0	95.6	95.8
ESTIMA	95.2	95.7	95.5
MARFONA	97.5	97.7	97.6
Mean	96.2	96.4	96.3

FUNGMETH SOILFUNG	PLANTING	SEEDRESS	Mean
THIA+IMA	95.7	96.4	96.0
TOLC MET	96.8	96.4	96.6
Mean	96.2	96.4	96.3

VARIETY	SOILFUNG FUNGMETH	THIA+IMA PLANTING	SEEDRESS	TOLC MET PLANTING	SEEDRESS
DESIREE		95.4	95.7	96.6	95.6
ESTIMA		94.0	95.6	96.5	95.9
MARFONA		97.7	97.8	97.3	97.7

EXTRA	DES NONE	EST NONE	MAR NONE	Mean
	96.0	96.9	96.4	96.4

GRAND MEAN 96.3

PLOT AREA HARVESTED 0.00075

90/W/P/1 BUTT FURLONG (W)

TOTAL TUBERS TONNES/HECTARE

***** Tables of means *****

SOILFUNG VARIETY	THIA+IMA	TOLC MET	Mean
DESIREE	59.5	54.7	57.1
ESTIMA	55.7	49.3	52.5
MARFONA	75.8	61.1	68.5
Mean	63.7	55.0	59.4

FUNGMETH VARIETY	PLANTING	SEEDRESS	Mean
DESIREE	60.2	54.0	57.1
ESTIMA	50.1	54.9	52.5
MARFONA	67.1	69.8	68.5
Mean	59.1	59.6	59.4

FUNGMETH SOILFUNG	PLANTING	SEEDRESS	Mean
THIA+IMA	62.8	64.6	63.7
TOLC MET	55.5	54.6	55.0
Mean	59.1	59.6	59.4

VARIETY	SOILFUNG THIA+IMA	FUNGMETH PLANTING	SEEDRESS	TOLC MET PLANTING	SEEDRESS
DESIREE		61.8	57.2	58.6	50.8
ESTIMA		46.9	64.5	53.2	45.4
MARFONA		79.6	72.1	54.7	67.6

EXTRA	DES NONE	EST NONE	MAR NONE	Mean
	62.1	58.6	68.2	63.0

GRAND MEAN 60.6

*** Standard errors of differences of means ***

VARIETY	SOILFUNG	FUNGMETH	VARIETY SOILFUNG
	4.68	3.82	6.62

VARIETY FUNGMETH	SOILFUNG FUNGMETH	VARIETY SOILFUNG FUNGMETH	EXTRA
	6.62	5.41	9.36

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	20	9.36	15.5

90/W/P/1 BUTT FURLONG (W)

PERCENTAGE WARE 3.81CM (1.5 INCH) RIDDLE

***** Tables of means *****

SOILFUNG VARIETY	THIA+IMA	TOLC MET	Mean
DESIREE	90.0	88.4	89.2
ESTIMA	91.0	93.5	92.2
MARFONA	94.4	93.1	93.7
Mean	91.8	91.7	91.7

FUNGMETH VARIETY	PLANTING	SEEDRESS	Mean
DESIREE	90.1	88.2	89.2
ESTIMA	90.8	93.7	92.2
MARFONA	93.8	93.7	93.7
Mean	91.6	91.9	91.7

FUNGMETH SOILFUNG	PLANTING	SEEDRESS	Mean
THIA+IMA	91.1	92.4	91.8
TOLC MET	92.0	91.3	91.7
Mean	91.6	91.9	91.7

VARIETY	SOILFUNG FUNGMETH	THIA+IMA PLANTING	TOLC MET SEEDRESS	SEEDRESS
DESIREE		90.1	89.8	86.7
ESTIMA		88.8	93.2	94.2
MARFONA		94.4	94.3	93.1

EXTRA	DES NONE	EST NONE	MAR NONE	Mean
	89.8	91.4	94.7	92.0

GRAND MEAN 91.8

PLOT AREA HARVESTED 0.00090