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86/R/P/4 Varieties and Stem Canker - Potatoes

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86/R/P/4

POTATOES

VARIETIES AND STEM CANKER

Object: To study the effects of stem canker (*Rhizoctonia solani*) on plant growth and yield of three early and three maincrop potato varieties using small and large chitted and unchitted seed - Great Knott I.

Sponsors: G.A. Hide, P.J. Read, J.P. Sandison.

Design: Early varieties: 3 randomised blocks of 12 plots.
Maincrop varieties: 3 randomised blocks of 24 plots.

Whole plot dimensions: 3.0 x 10.7.

Treatments:

To EARLY varieties, all combinations of:-

- | | |
|-------------|-------------------------------|
| 1. VARIETY | Varieties: |
| A COMET | Arran Comet |
| ESTIMA | Estima |
| WILJA | Wilja |
| 2. INOCULUM | Inoculum to seed at planting: |
| NONE | None |
| RHIZOCT | R. solani inoculum |
| 3. SD SIZE | Mean seed sizes per tuber: |
| LARGE | 134 g |
| SMALL | 50 g |

To MAINCROP varieties, all combinations of:-

- | | |
|-------------|-------------------------------|
| 1. VARIETY | Varieties: |
| DESIREE | Desiree |
| M PIPER | Maris Piper |
| P SQUIRE | Pentland Squire |
| 2. INOCULUM | Inoculum to seed at planting: |
| NONE | None |
| RHIZOCT | R. solani inoculum |
| 3. SD SIZE | Mean seed sizes per tuber |
| LARGE | 134 g |
| SMALL | 50 g |
| 4. SD TREAT | Seed treatment: |
| NONE | |
| CHITTED | |

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- NOTES: (1) *Rhizoctonia inoculum* was grown on horticultural vermiculite and sprinkled over seed tubers at planting before covering.
(2) Large seed was spaced at 48 cm in the row and small seed at 30 cm.

Basal applications: Manures: Muriate of potash at 420 kg. FYM at 35 t. (10:10:15+4.5 Mg) at 1960 kg. Weedkillers: Linuron at 1.3 kg with paraquat at 0.50 kg ion in 200 l. Fungicides: Mancozeb at 1.4 kg in 200 l on four occasions, applied with the insecticide on the third occasion. Fentin hydroxide at 0.28 kg in 200 l on two occasions, applied with the insecticide on the first occasion. Insecticide: Pirimicarb at 0.14 kg on two occasions. Haulm desiccant: Diquat at 0.80 kg ion in 500 l.

Cultivations, etc.:— K applied: 12 Nov, 1985. FYM applied: 29 Nov. Ploughed: 10 Dec. NPK Mg applied, rotary harrowed: 30 Apr, 1986. Planted by hand: 1 May. Weedkillers applied: 26 May. Mancozeb applied: 30 June, 14 July, 12 Aug. Mancozeb with the insecticide applied: 28 July. Fentin hydroxide with the insecticide applied: 29 Aug. Fentin hydroxide applied: 11 Sept. Haulm desiccant applied: 17 Sept. Haulm mechanically destroyed: 1 Oct. Lifted: 2 Oct. Previous crops: W. wheat 1984, s. beans 1985.

NOTE: Plant samples were taken from all varieties in June, July and August, to assess stem canker, weight of foliage and weight and number of tubers.

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EARLY VARIETIES

TOTAL TUBERS TONNES/HECTARE

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

INOCULUM VARIETY	NONE	RHIZOCT	MEAN	
A COMET	60.8	55.7	58.3	
ESTIMA	55.3	53.6	54.5	
WILJA	58.4	53.9	56.2	
MEAN	58.2	54.4	56.3	
SD SIZE VARIETY	LARGE	SMALL	MEAN	
A COMET	59.2	57.3	58.3	
ESTIMA	51.9	57.1	54.5	
WILJA	58.0	54.4	56.2	
MEAN	56.4	56.3	56.3	
SD SIZE INOCULUM	LARGE	SMALL	MEAN	
NONE	58.2	58.1	58.2	
RHIZOCT	54.5	54.4	54.4	
MEAN	56.4	56.3	56.3	
INOCULUM SD SIZE VARIETY	NONE LARGE	SMALL	RHIZOCT LARGE	SMALL
A COMET	61.0	60.5	57.3	54.2
ESTIMA	53.7	57.0	50.1	57.1
WILJA	60.0	56.8	56.0	51.9

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

TABLE	VARIETY	INOCULUM	SD SIZE	VARIETY INOCULUM
SED	1.94	1.59	1.59	2.75
TABLE	VARIETY SD SIZE	INOCULUM SD SIZE	VARIETY INOCULUM SD SIZE	
SED	2.75	2.25	3.89	

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

STRATUM	DF	SE	CV%
BLOCK.WP	22	4.76	8.5

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EARLY VARIETIES

PERCENTAGE WARE 4.44CM (1.75 INCH) RIDDLE

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

INOCULUM	NONE	RHIZOCT	MEAN	
VARIETY				
A COMET	83.4	87.9	85.7	
ESTIMA	84.7	89.3	87.0	
WILJA	78.5	84.1	81.3	
MEAN	82.2	87.1	84.7	
SD SIZE	LARGE	SMALL	MEAN	
VARIETY				
A COMET	82.3	89.0	85.7	
ESTIMA	85.9	88.1	87.0	
WILJA	80.9	81.8	81.3	
MEAN	83.0	86.3	84.7	
SD SIZE	LARGE	SMALL	MEAN	
INOCULUM				
NONE	80.3	84.1	82.2	
RHIZOCT	85.8	88.5	87.1	
MEAN	83.0	86.3	84.7	
INOCULUM	NONE	SMALL	RHIZOCT	SMALL
SD SIZE	LARGE		LARGE	
VARIETY				
A COMET	78.8	87.9	85.9	90.0
ESTIMA	84.3	85.2	87.5	91.0
WILJA	77.8	79.1	83.9	84.4

PLOT AREA HARVESTED SD SIZE LARGE 0.00053
SD SIZE SMALL 0.00091

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MAINCROP VARIETIES

TOTAL TUBERS TONNES/HECTARE

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

INOCULUM	NONE	RHIZOCT	MEAN	
VARIETY				
DESIREE	50.4	47.7	49.0	
M PIPER	58.5	54.3	56.4	
P SQUIRE	56.8	47.4	52.1	
MEAN	55.2	49.8	52.5	
SD SIZE	LARGE	SMALL	MEAN	
VARIETY				
DESIREE	49.7	48.3	49.0	
M PIPER	56.4	56.4	56.4	
P SQUIRE	52.7	51.5	52.1	
MEAN	52.9	52.1	52.5	
SD SIZE	LARGE	SMALL	MEAN	
INOCULUM				
NONE	54.5	55.9	55.2	
RHIZOCT	51.3	48.2	49.8	
MEAN	52.9	52.1	52.5	
SD TREAT	NONE	CHITTED	MEAN	
VARIETY				
DESIREE	46.5	51.5	49.0	
M PIPER	54.7	58.1	56.4	
P SQUIRE	50.9	53.3	52.1	
MEAN	50.7	54.3	52.5	
SD TREAT	NONE	CHITTED	MEAN	
INOCULUM				
NONE	54.2	56.2	55.2	
RHIZOCT	47.2	52.4	49.8	
MEAN	50.7	54.3	52.5	
SD TREAT	NONE	CHITTED	MEAN	
SD SIZE				
LARGE	51.2	54.6	52.9	
SMALL	50.2	54.0	52.1	
MEAN	50.7	54.3	52.5	
INOCULUM	NONE	RHIZOCT		
SD SIZE	LARGE	SMALL	LARGE	SMALL
VARIETY				
DESIREE	50.5	50.2	48.9	46.4
M PIPER	57.3	59.6	55.5	53.1
P SQUIRE	55.8	57.9	49.6	45.1

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MAINCROP VARIETIES

TOTAL TUBERS TONNES/HECTARE

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

INOCULUM	NONE	CHITTED	RHIZOCT	NONE	CHITTED
SD TREAT	NONE	CHITTED	NONE	CHITTED	
VARIETY					
DESIREE	48.3	52.5	44.8	50.6	
M PIPER	57.2	59.7	52.3	56.4	
P SQUIRE	57.2	56.5	44.6	50.1	
SD SIZE	LARGE		SMALL		
SD TREAT	NONE	CHITTED	NONE	CHITTED	
VARIETY					
DESIREE	47.4	51.9	45.6	51.1	
M PIPER	55.0	57.8	54.4	58.3	
P SQUIRE	51.2	54.1	50.5	52.5	
SD SIZE	LARGE		SMALL		
SD TREAT	NONE	CHITTED	NONE	CHITTED	
INOCULUM					
NONE	53.8	55.3	54.6	57.2	
RHIZOCT	48.7	54.0	45.8	50.7	
VARIETY	SD SIZE	LARGE	CHITTED	SMALL	CHITTED
DESIREE	INOCULUM	NONE		NONE	
	NONE	49.3	51.7	47.2	53.2
	RHIZOCT	45.6	52.2	43.9	49.0
M PIPER	NONE	56.0	58.6	58.4	60.8
	RHIZOCT	54.0	57.0	50.5	55.8
P SQUIRE	NONE	56.1	55.4	58.2	57.6
	RHIZOCT	46.3	52.9	42.9	47.3

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MAINCROP VARIETIES

TOTAL TUBERS TONNES/HECTARE

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

TABLE	VARIETY	INOCULUM	SD SIZE	SD TREAT
SED	1.03	0.84	0.84	0.84
TABLE	VARIETY INOCULUM	VARIETY SD SIZE	INOCULUM SD SIZE	VARIETY SD TREAT
SED	1.46	1.46	1.19	1.46
TABLE	INOCULUM SD TREAT	SD SIZE SD TREAT	VARIETY INOCULUM SD SIZE	VARIETY INOCULUM SD TREAT
SED	1.19	1.19	2.07	2.07
TABLE	VARIETY SD SIZE SD TREAT	INOCULUM SD SIZE SD TREAT	VARIETY INOCULUM SD SIZE SD TREAT	
SED	2.07	1.69	2.92	

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

STRATUM	DF	SE	CV%
BLOCK.WP	46	3.58	6.8

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MAINCROP VARIETIES

PERCENTAGE WARE 4.44CM (1.75 INCH) RIDDLE

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

INOCULUM	NONE	RHIZOCT	MEAN
VARIETY			
DESIREE	82.2	87.2	84.7
M PIPER	82.4	84.0	83.2
P SQUIRE	94.8	91.9	93.3
MEAN	86.4	87.7	87.1
SD SIZE	LARGE	SMALL	MEAN
VARIETY			
DESIREE	84.4	85.0	84.7
M PIPER	81.7	84.7	83.2
P SQUIRE	92.9	93.7	93.3
MEAN	86.4	87.8	87.1
SD SIZE	LARGE	SMALL	MEAN
INOCULUM			
NONE	86.2	86.7	86.4
RHIZOCT	86.5	88.9	87.7
MEAN	86.4	87.8	87.1
SD TREAT	NONE	CHITTED	MEAN
VARIETY			
DESIREE	83.6	85.9	84.7
M PIPER	82.9	83.5	83.2
P SQUIRE	92.2	94.4	93.3
MEAN	86.2	87.9	87.1
SD TREAT	NONE	CHITTED	MEAN
INOCULUM			
NONE	85.1	87.8	86.4
RHIZOCT	87.4	88.1	87.7
MEAN	86.2	87.9	87.1
SD TREAT	NONE	CHITTED	MEAN
SD SIZE			
LARGE	85.5	87.2	86.4
SMALL	87.0	88.6	87.8
MEAN	86.2	87.9	87.1

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MAINCROP VARIETIES

PERCENTAGE WARE 4.44CM (1.75 INCH) RIDDLE

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

INOCULUM	NONE	SMALL	RHIZOCT	SMALL
SD SIZE	LARGE	SMALL	LARGE	SMALL
VARIETY				
DESIREE	82.5	81.9	86.4	88.1
M PIPER	81.1	83.6	82.3	85.8
P SQUIRE	94.9	94.6	90.9	92.8

INOCULUM	NONE	CHITTED	RHIZOCT	CHITTED
SD TREAT	NONE	CHITTED	NONE	CHITTED
VARIETY				
DESIREE	80.3	84.0	86.8	87.7
M PIPER	81.0	83.7	84.8	83.3
P SQUIRE	93.9	95.6	90.5	93.3

SD SIZE	LARGE	SMALL	SMALL	CHITTED
SD TREAT	NONE	CHITTED	NONE	CHITTED
VARIETY				
DESIREE	83.0	85.9	84.1	85.9
M PIPER	81.5	81.9	84.3	85.1
P SQUIRE	91.9	94.0	92.5	94.9

SD SIZE	LARGE	SMALL	SMALL	CHITTED
SD TREAT	NONE	CHITTED	NONE	CHITTED
INOCULUM				
NONE	84.9	87.4	85.2	88.1
RHIZOCT	86.0	87.1	88.7	89.1

VARIETY	SD SIZE	LARGE	CHITTED	SMALL	CHITTED
INOCULUM	SD TREAT	NONE	CHITTED	NONE	CHITTED
DESIREE	NONE	80.7	84.3	80.0	83.8
	RHIZOCT	85.3	87.5	88.3	87.9
M PIPER	NONE	79.7	82.5	82.3	84.9
	RHIZOCT	83.3	81.3	86.4	85.2
P SQUIRE	NONE	94.4	95.5	93.5	95.7
	RHIZOCT	89.4	92.4	91.5	94.2

PLOT AREA HARVESTED	SD SIZE SMALL	0.00091
	SD SIZE LARGE	0.00053