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85/R/P/1 Varieties and Stem Canker - Potatoes

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85/R/P/1

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 - Highfield IV.

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 |

85/R/P/1

4. SD TREAT Seed treatment:

NONE
CHITTED

NOTES: (1) Rhizoctonia inoculum was grown on horticultural vermiculite and sprinkled over seed tubers at planting before covering.
(2) Large seed was spaced at 51 cm in the row and small seed at 30 cm.

Basal applications: Manures: (0:18:36) at 690 kg. (10:10:15+4.5Mg) 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 second and third occasions. Fentin hydroxide at 0.28 kg in 200 l on two occasions. Insecticide: Pirimicarb at 0.14 kg on two occasions. Haulm desiccant: BOV at 170 l.

Cultivations, etc.: - PK applied: 10 Oct, 1984. Ploughed: 19 Nov. NPK Mg applied: 4 Apr, 1985. Rotary harrowed: 17 Apr. Planted by hand: 19 Apr. Weedkillers applied: 16 May. Mancozeb applied: 20 June, 6 Aug. Mancozeb with pirimicarb applied: 4 July, 23 July. Fentin hydroxide applied: 21 Aug, 11 Sept. Desiccant applied: 10 Oct. Lifted: 21 Oct. Previous crops: S. barley 1983, w. beans 1984.

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

85/R/P/1 EARLY VARIETIES

TOTAL TUBERS TONNES/HECTARE

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

INOCULUM VARIETY	NONE	RHIZOCT	MEAN	
A COMET	56.8	53.4	55.1	
ESTIMA	74.3	69.5	71.9	
WILJA	73.4	58.2	65.8	
MEAN	68.2	60.4	64.3	
SD SIZE VARIETY	LARGE	SMALL	MEAN	
A COMET	56.6	53.7	55.1	
ESTIMA	73.0	70.8	71.9	
WILJA	65.8	65.8	65.8	
MEAN	65.1	63.4	64.3	
SD SIZE INOCULUM	LARGE	SMALL	MEAN	
NONE	68.7	67.7	68.2	
RHIZOCT	61.5	59.2	60.4	
MEAN	65.1	63.4	64.3	
INOCULUM SD SIZE VARIETY	NONE LARGE	SMALL	RHIZOCT LARGE	SMALL
A COMET	58.2	55.5	55.0	51.9
ESTIMA	74.2	74.4	71.8	67.2
WILJA	73.8	73.1	57.8	58.5

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

TABLE	VARIETY	INOCULUM	SD SIZE	VARIETY INOCULUM
SED	2.38	1.94	1.94	3.36
TABLE	VARIETY SD SIZE	INOCULUM SD SIZE	VARIETY INOCULUM SD SIZE	
SED	3.36	2.74	4.75	

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

STRATUM	DF	SE	CV%
BLOCK.WP	22	5.82	9.1

85/R/P/1 EARLY VARIETIES

PERCENTAGE WARE 4.44CM (1.75 INCH) RIDDLE

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

INOCULUM VARIETY	NONE	RHIZOCT	MEAN
A COMET	63.5	78.1	70.8
ESTIMA	89.5	89.7	89.6
WILJA	79.4	80.1	79.7
MEAN	77.5	82.6	80.0

SD SIZE VARIETY	LARGE	SMALL	MEAN
A COMET	71.1	70.5	70.8
ESTIMA	90.1	89.2	89.6
WILJA	79.8	79.6	79.7
MEAN	80.3	79.7	80.0

SD SIZE INOCULUM	LARGE	SMALL	MEAN
NONE	77.6	77.4	77.5
RHIZOCT	83.1	82.1	82.6
MEAN	80.3	79.7	80.0

INOCULUM SD SIZE VARIETY	NONE LARGE	SMALL	RHIZOCT LARGE	SMALL
A COMET	63.9	63.1	78.3	77.8
ESTIMA	90.2	88.9	90.0	89.4
WILJA	78.7	80.0	81.0	79.2

PLOT AREA HARVESTED	SD SIZE LARGE	0.00061
	SMALL	0.00096

85/R/P/1 MAIN CROP VARIETIES

TOTAL TUBERS TONNES/HECTARE

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

INOCULUM VARIETY	NONE	RHIZOCT	MEAN
DESIREE	66.4	60.3	63.3
M PIPER	72.0	62.0	67.0
P SQUIRE	74.2	58.7	66.5
MEAN	70.9	60.3	65.6
SD SIZE VARIETY	LARGE	SMALL	MEAN
DESIREE	64.2	62.4	63.3
M PIPER	69.3	64.7	67.0
P SQUIRE	69.3	63.6	66.5
MEAN	67.6	63.6	65.6
SD SIZE INOCULUM	LARGE	SMALL	MEAN
NONE	72.2	69.6	70.9
RHIZOCT	63.0	57.6	60.3
MEAN	67.6	63.6	65.6
SD TREAT VARIETY	NONE	CHITTED	MEAN
DESIREE	61.5	65.2	63.3
M PIPER	66.4	67.6	67.0
P SQUIRE	65.0	67.9	66.5
MEAN	64.3	66.9	65.6
SD TREAT INOCULUM	NONE	CHITTED	MEAN
NONE	68.9	72.9	70.9
RHIZOCT	59.7	60.9	60.3
MEAN	64.3	66.9	65.6
SD TREAT SD SIZE	NONE	CHITTED	MEAN
LARGE	65.5	69.7	67.6
SMALL	63.1	64.1	63.6
MEAN	64.3	66.9	65.6
VARIETY	SD SIZE	LARGE	SMALL
DESIREE	INOCULUM		
	NONE	65.8	67.1
	RHIZOCT	62.7	57.8
M PIPER	NONE	74.4	69.6
	RHIZOCT	64.1	59.8
P SQUIRE	NONE	76.3	72.2
	RHIZOCT	62.4	55.1

85/R/P/1 MAIN CROP VARIETIES

TOTAL TUBERS TONNES/HECTARE

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

VARIETY	SD TREAT	NONE	CHITTED
DESIREE	INOCULUM		
	NONE	64.5	68.3
M PIPER	RHIZOCT	58.4	62.1
	NONE	71.2	72.9
P SQUIRE	RHIZOCT	61.6	62.3
	NONE	70.9	77.6
	RHIZOCT	59.2	58.3

VARIETY	SD TREAT	NONE	CHITTED
DESIREE	SD SIZE		
	LARGE	62.4	66.1
M PIPER	SMALL	60.5	64.4
	LARGE	66.9	71.6
P SQUIRE	SMALL	65.9	63.6
	LARGE	67.2	71.4
	SMALL	62.8	64.4

INOCULUM	SD TREAT	NONE	CHITTED
NONE	SD SIZE		
	LARGE	69.6	74.7
RHIZOCT	SMALL	68.1	71.1
	LARGE	61.4	64.7
	SMALL	58.0	57.1

VARIETY	SD SIZE	LARGE	CHITTED	SMALL	CHITTED
DESIREE	SD TREAT				
	INOCULUM				
M PIPER	NONE	64.2	67.4	64.8	69.3
	RHIZOCT	60.6	64.7	56.2	59.5
P SQUIRE	NONE	71.2	77.7	71.2	68.1
	RHIZOCT	62.6	65.6	60.6	59.1
	NONE	73.5	79.1	68.3	76.0
	RHIZOCT	60.9	63.8	57.4	52.8

85/R/P/1 MAIN CROP VARIETIES

TOTAL TUBERS TONNES/HECTARE

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

TABLE	VARIETY	INOCULUM	SD SIZE	SD TREAT
SED	1.26	1.03	1.03	1.03

TABLE	VARIETY INOCULUM	VARIETY SD SIZE	INOCULUM SD SIZE	VARIETY SD TREAT
SED	1.78	1.78	1.46	1.78

TABLE	INOCULUM SD TREAT	SD SIZE SD TREAT	VARIETY INOCULUM SD SIZE	VARIETY INOCULUM SD TREAT
SED	1.46	1.46	2.52	2.52

TABLE	VARIETY SD SIZE SD TREAT	INOCULUM SD SIZE SD TREAT	VARIETY INOCULUM SD SIZE SD TREAT
SED	2.52	2.06	3.57

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

STRATUM	DF	SE	CV%
BLOCK.WP	46	4.37	6.7

85/R/P/1 MAIN CROP VARIETIES

PERCENTAGE WARE 4.44CM (1.75 INCH) RIDDLE

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

INOCULUM	NONE	RHIZOCT	MEAN
VARIETY			
DESIREE	84.4	85.7	85.0
M PIPER	83.3	83.7	83.5
P SQUIRE	90.8	92.1	91.5
MEAN	86.2	87.2	86.7
SD SIZE	LARGE	SMALL	MEAN
VARIETY			
DESIREE	85.2	84.9	85.0
M PIPER	84.6	82.4	83.5
P SQUIRE	90.8	92.1	91.5
MEAN	86.9	86.5	86.7
SD SIZE	LARGE	SMALL	MEAN
INOCULUM			
NONE	86.0	86.3	86.2
RHIZOCT	87.8	86.6	87.2
MEAN	86.9	86.5	86.7
SD TREAT	NONE	CHITTED	MEAN
VARIETY			
DESIREE	84.7	85.4	85.0
M PIPER	83.4	83.6	83.5
P SQUIRE	91.0	91.9	91.5
MEAN	86.4	87.0	86.7
SD TREAT	NONE	CHITTED	MEAN
INOCULUM			
NONE	85.8	86.5	86.2
RHIZOCT	86.9	87.4	87.2
MEAN	86.4	87.0	86.7
SD TREAT	NONE	CHITTED	MEAN
SD SIZE			
LARGE	87.0	86.8	86.9
SMALL	85.8	87.1	86.5
MEAN	86.4	87.0	86.7
VARIETY	SD SIZE	LARGE	SMALL
DESIREE	INOCULUM		
	NONE	84.0	84.8
	RHIZOCT	86.3	85.1
M PIPER	NONE	84.2	82.4
	RHIZOCT	85.0	82.5
P SQUIRE	NONE	89.7	91.8
	RHIZOCT	92.0	92.3

85/R/P/1 MAIN CROP VARIETIES

PERCENTAGE WARE 4.44CM (1.75 INCH) RIDDLE

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

VARIETY	SD TREAT	NONE	CHITTED
DESIREE	INOCULUM		
	NONE	84.1	84.8
M PIPER	RHIZOCT	85.4	86.0
	NONE	83.0	83.5
P SQUIRE	RHIZOCT	83.8	83.7
	NONE	90.4	91.2
	RHIZOCT	91.6	92.6

VARIETY	SD TREAT	NONE	CHITTED
DESIREE	SD SIZE		
	LARGE	84.7	85.6
	SMALL	84.7	85.1
M PIPER	LARGE	85.3	83.9
	SMALL	81.5	83.3
P SQUIRE	LARGE	90.9	90.8
	SMALL	91.1	93.0

INOCULUM	SD TREAT	NONE	CHITTED
NONE	SD SIZE		
	LARGE	85.9	86.0
	SMALL	85.7	86.9
RHIZOCT	LARGE	88.0	87.5
	SMALL	85.9	87.3

VARIETY	SD TREAT	SD SIZE	LARGE	CHITTED	SMALL	CHITTED
DESIREE	INOCULUM	NONE	84.2	83.9	83.9	85.6
		RHIZOCT	85.3	87.3	85.5	84.6
M PIPER	INOCULUM	NONE	84.2	84.2	81.9	82.8
		RHIZOCT	86.4	83.6	81.1	83.8
P SQUIRE	INOCULUM	NONE	89.4	90.0	91.3	92.4
		RHIZOCT	92.3	91.6	91.0	93.6

PLOT AREA HARVESTED SD SIZE LARGE 0.00099
SMALL 0.00119