To evaluate novel & existing fungicide seed tuber treatments applied just prior to planting for the control of skin spot

A trial for Potatoes in Practice 2005

Report prepared by:

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CONTENTS

SUMMARY

In a replicated trial, a series of approved and experimental seed tuber treatments were evaluated for the control of skin spot. A stock of Kerr's Pink showing severe skin spot was treated on a roller table just prior to planting. The daughter tubers were lifted late and kept in an ambient store until assessment the following February.

All seed tuber treatments tested significantly reduced the severity of skin spot but only one treatments significantly reduced the incidence. Other reductions in disease were recorded.

1. Study Protocol

Crops Division Study Number 00973

Study Title: Evaluation of potential seed treatments for the control of skin spot

Name of Sponsors / Contacts: BPC (PIP2005)

Study Objectives: To evaluate novel and existing fungicide seed tuber treatments applied just prior to planting for the control of skin spot

Study Timetable: April 2005 to March 2006

Location of test facilities: Gourdie Farm, SCRI, Dundee

Variety: Kerrs Pink with skin-spot

Treatments

Treat.	Active ingredient	Product	Product dose
1	Untreated control	-	-
2	Imazalil	Fungazil 100SL	100 ml/tonne
3	Thiabendazole	Storite Excel	80 ml/t
4	Imazalil + thiabendazole	Fungazil 100SL + Storite Excel	100 ml/tonne + 80 ml/t
5	Mancozeb	Dithane	2.5 kg/t
6	Mancozeb	Dithane	3.75 kg/t
7	Fludioxinil	Celest 100 FL	250 ml/tonne
8	Prothioconazole + pencycuron	UKA369	600 ml/t
9	Experimental	Bayer	200 ml/t
10	Boscalid + pyraclostrobin	Signum	0.5 kg/t
11	Flutolanil	Rhino	200 ml/tonne
12	Flutolanil + mancozeb	CERF012	2 kg/t

Applied on 15th May. Liquid was applied at a rate 3.95 l/t for this stock
All tubers put over the roller table irrespective of liquid or dust treatment

Plot size: 2 drill x 20 tubers

No. plots: 48

Trial design: Randomised complete block with 4 replicates

Planting date: 17 May 2005

Haulm destruction:	13 September 2005
Harvest:	10 November 2005
Storage:	Ambient store at SAC Aberdeen
Post harvest assessment:	14 February 2006
Soil type:	Sandy loam

Assessments:
Disease on tubers at planting and degree of sprouting
Emergence at c. 50 and 90% emergence of untreated control
Vigour and ground cover at 90% emergence, 4 weeks later and flowering
Disease on tubers February 2006 after storage

Trial Maintenance:	SCRI Estate staff Trial grown under standard conditions for potato production
Disposal of test system:	Crop destruct
Study status:	PSD status
Location of raw data:	Roger Griffin Walker
Study personnel:	Dr Alex Hilton, SAC Dr Stuart Wale, SAC

2. Results

a) Disease on seed tubers at planting

Assessment	%Severity	% Incidence
Common Scab	2.96	66
Powdery Scab	0.04	2
Black Scurf	0.18	12
Silver Scurf	23.64	100
Black dot	0.12	2
Skin spot	5.36	80

Seed tubers had large green chits at planting

b) Emergence and vigour

Disease Code				Emergence		Emergence		Vigour		Emergence		Vigour		Ground Cover	
Rating Unit				%		%		1-9		%		1-9		%	
Rating Date				10/06/2005		16/06/2005		16/06/2005		24/06/2005		24/06/2005		24/06/2005	
Assessed By				SM		RDGW		RDGW		MS		MS		MS	
Trt	Treatment		Rate												
No.	Name	Rate	Unit												
1	Untreated			20	a	91	a	4	a	98	a	7	a	38	a
2	Fungazil 100SL	10	ML/100 KG	19	a	85	a	4	a	100	a	7	a	41	a
3	Storite Excel	8	ML/100 KG	18	a	98	a	4	a	100	a	8	a	41	a
4	Fungazil 100SL +	10	ML/100 KG	14	a	89	a	4	a	98	a	7	a	42	a
	Storite Excel	8	ML/100 KG												
5	Dithane	2.5	KG/UNIT	23	a	95	a	4	a	100	a	8	a	43	a
6	Dithane	3.75	KG/UNIT	20	a	93	a	4	a	100	a	8	a	38	a
7	Celest 100 FS	25	ML/100 KG	38	a	96	a	5	a	100	a	8	a	41	a
8	UKA369	60	ML/100 KG	21	a	96	a	4	a	100	a	8	a	42	a
9	Experimental product 1 (Bayer)	20	ML/100 KG	31	a	96	a	5	a	98	a	8	a	39	a
10	Signum	0.5	KG/UNIT	30	a	94	a	5	a	98	a	8	a	41	a
11	Rhino	20	ML/100 KG	31	a	95	a	4	a	97	a	7	a	42	a
12	CERF012	2	KG/UNIT	23	a	90	a	5	a	98	a	8	a	42	a
LSD (P=.05)				15.7		9.2		1.3		4.3		1.5		5	
Standard Deviation				10.9		6.4		0.9		2.5		0.9		3	
CV				45.55		6.87		21.84		2.55		11.7		7.32	
Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)															

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Disease Code				Vigour		Ground Cover		Vigour		Ground Cover	
Rating Unit				1-9		%		1-9		%	
Rating Date				30/06/2005		04/07/2005		18/07/2005		18/07/2005	
Assessed By				RDGW		RDGW		MS		MS	
Trt	Treatment		Rate								
No.	Name	Rate	Unit								
1	Untreated			7	a	47	a	8	a	100	a
2	Fungazil 100SL	10	ML/100 KG	7	a	45	a	8	a	100	a
3	Storite Excel	8	ML/100 KG	7	a	46	a	9	a	100	a
4	Fungazil 100SL +	10	ML/100 KG	7	a	49	a	9	a	100	a
	Storite Excel	8	ML/100 KG								
5	Dithane	2.5	KG/UNIT	7	a	50	a	8	a	100	a
6	Dithane	3.75	KG/UNIT	7	a	45	a	9	a	100	a
7	Celest 100 FS	25	ML/100 KG	8	a	51	a	8	a	100	a
8	UKA369	60	ML/100 KG	7	a	51	a	8	a	100	a
9	Experimental product 1 (Bayer)	20	ML/100 KG	7	a	47	a	8	a	100	a
10	Signum	0.5	KG/UNIT	7	a	47	a	9	a	100	a
11	Rhino	20	ML/100 KG	7	a	50	a	8	a	100	a
12	CERF012	2	KG/UNIT	7	a	45	a	9	a	100	a
LSD (P=.05)				1.1		13.6		1.3		0	
Standard Deviation				0.7		9.4		0.9		0	
CV				10.4		19.82		10.48		0	
Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)											

- None of the treatments caused any detrimental effect on emergence, vigour or ground cover
- Yield and tuber numbers were not assessed in this trial

c) Tuber assessment post storage (14 February 2006)

Disease Code				Common scab		Common scab		Black scurf		Black scurf		Silver scurf		Silver scurf	
Rating Unit				%severity		%incidence		%severity		%incidence		%severity		%incidence	
Rating Date				14/02/2006		14/02/2006		14/02/2006		14/02/2006		14/02/2006		14/02/2006	
Assessed By				VGW		VGW		VGW		VGW		VGW		VGW	
Trt	Treatment		Rate												
No.	Name	Rate	Unit												
1	Untreated			1.1	a	64	a	0.5	a	21	a	2.3	ab	43	a
2	Fungazil 100SL	10	ML/100 KG	1.5	a	72	a	0.3	ab	5	b	3.2	a	62	a
3	Storite Excel	8	ML/100 KG	0.9	a	56	ab	0	b	0	b	2.8	ab	52	a
4	Fungazil 100SL +	10	ML/100 KG	1.4	a	73	a	0.1	b	5	b	2.4	ab	57	a
	Storite Excel	8	ML/100 KG												
5	Dithane	2.5	KG/UNIT	1.6	a	75	a	0	b	1	b	0.3	c	16	b
6	Dithane	3.75	KG/UNIT	1.7	a	75	a	0.1	b	5	b	0.4	c	10	b
7	Celest 100 FS	25	ML/100 KG	0.6	a	42	b	0	b	0	b	1.3	bc	43	a
8	UKA369	60	ML/100 KG	1.7	a	71	a	0	b	1	b	1.8	abc	42	a
9	Experimental product 1 (Bayer)	20	ML/100 KG	1.6	a	75	a	0	b	0	b	3.2	a	49	a
10	Signum	0.5	KG/UNIT	1.3	a	68	a	0	b	3	b	1.9	abc	57	a
11	Rhino	20	ML/100 KG	1.4	a	69	a	0	b	1	b	2.1	ab	49	a
12	CERF012	2	KG/UNIT	1	a	64	a	0	b	1	b	0.3	c	19	b
LSD (P=.05)				0.72		15.7		0.26		7.6		1.17		15.2	
Standard Deviation				0.5		10.9		0.18		5.2		0.81		10.5	
CV				37.7		16.31		205.92		157.48		44.52		25.44	
Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)															

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Disease Code				Black dot		Black dot		Skin spot		Skin spot	
Rating Unit				%severity		%incidence		%incidence		%severity	
Rating Date				14/02/2006		14/02/2006		14/02/2006		14/02/2006	
Assessed By				VGW		VGW		VGW		VGW	
Trt	Treatment		Rate								
No.	Name	Rate	Unit								
1	Untreated			2	a	18	a	77	a	7.6	a
2	Fungazil 100SL	10	ML/100 KG	2.8	a	20	a	58	ab	2.4	b
3	Storite Excel	8	ML/100 KG	0.6	a	5	a	61	ab	3	b
4	Fungazil 100SL +	10	ML/100 KG	1.8	a	19	a	53	ab	1.8	b
	Storite Excel	8	ML/100 KG								
5	Dithane	2.5	KG/UNIT	2	a	19	a	74	a	4	b
6	Dithane	3.75	KG/UNIT	3.1	a	26	a	56	ab	1.7	b
7	Celest 100 FS	25	ML/100 KG	2.9	a	19	a	60	ab	2.2	b
8	UKA369	60	ML/100 KG	2	a	18	a	65	ab	3	b
9	Experimental product 1 (Bayer)	20	ML/100 KG	1.1	a	10	a	72	a	2.5	b
10	Signum	0.5	KG/UNIT	2	a	25	a	39	b	1.1	b
11	Rhino	20	ML/100 KG	2.9	a	26	a	65	ab	3	b
12	CERF012	2	KG/UNIT	2.4	a	19	a	58	ab	2.1	b
LSD (P=.05)				2.68		14.4		16.2		2.82	
Standard Deviation				1.86		10		11.2		1.95	
CV				86.47		54.37		18.29		67.65	
Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)											

3. Discussion and comments

- No treatment had any effect on emergence, vigour or crop ground cover.
- Significant reductions in skin-spot severity were observed with all treatments. Fungazil, Storite Excel, Dithane, Celest, Signum, Rhino and the experimental products were all effective. Increasing the concentration of Dithane from 2.5 to 3.75 kg/t appeared to improve efficacy and reduced severity from 4 to 1.7%. Where Storite Excel was added to Fungazil this also improved efficacy reducing severity from 2.4% where Fungazil was used alone to 1.8% where used in combination.
- Only Signum caused a significant reduction in incidence of skin spot from 77% in the untreated control to 39%.
- The Dithane treatments and CERF012 significantly reduced silver scurf incidence and severity.
- Common scab incidence was significantly reduced by Celest.
- Black scurf incidence and severity was significantly reduced by all treatments except severity by Fungazil.