



Final Report

The tolerance of a range of potato varieties to post- emergence herbicides

Ref: R462

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Reporting Period: April 2012 – Sept. 2013

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1. Introduction

Weed control in potatoes is based on the application of selective residual herbicides in mixture with total contact herbicides, prior to crop emergence. These tactics usually provide good weed control with low risk of crop damage where there is adequate soil moisture and a fine soil tilth. Unfortunately, conditions are not always conducive to effective weed control from residual herbicides. In these seasons, the additional weed control provided by less crop-safe, selective post-emergence herbicides is required.

Dry soil conditions during spring, adversely affect the efficacy of residual herbicides in potatoes, especially where the production of a fine soil tilth is not possible. Most post-emergence herbicides approved for use in potatoes are older, off-patent products which will not be further developed by manufacturers / agents due to cost and increased liability.

Some work on variety tolerance to post-emergence herbicides is available for older varieties but there is no information for most new varieties. Also, the crop safety data was generated for rates of herbicide not relevant to the control of small annual weeds in potatoes.

The project was commissioned to provide independent information to update contact herbicide safety data over a range of widely grown potato varieties, at rates of herbicide consistent with post-emergence use.

The results do not constitute a recommendation but provide guidance when making the very difficult agronomic decision between crop damage from herbicide versus crop damage from uncontrolled weed growth.

2. Aims and Objectives

To provide new information on the tolerance of a range of potato varieties to post emergence applications of metribuzin, bentazone and a tank mixture of rimsulfuron and metribuzin.

3. Methods and Materials

Twenty of the most widely grown UK potato varieties were selected for the herbicide tolerance trials. Two geographically separate trial sites were established in 2012 and 2013 at Staffordshire and Lincolnshire.

Each trial was hand planted in a split-plot design with three replicates. Herbicides were applied when the majority of varieties had reached a stem length of 15cm. This growth stage was chosen to comply with the latest post-emergence timing on metribuzin labels.

Herbicide treatments (Table 3.1) were applied with a Pulvexpur trial sprayer at a water rate of 200l/ha, as a medium spray through a flat fan nozzle. Fertiliser and fungicide programmes were consistent with local practise.

Table 3.1 – Herbicide treatments.

Treatment	Rate a.i./ha
1. Untreated control	
2. metribuzin	350g
3. metribuzin	140g
4. bentazone + Cropspray IIE*	1440g + 2.0l/ha
5.rimsulfuron + metribuzin	12.5g + 140g

* Cropspray IIE is a mineral oil adjuvant recommended for use with bentazone.

Table 3.2 – Site details.

	Site 1 - 2012	Site 2 - 2012	Site 1 - 2013	Site 2 - 2013
Location	Holbeach Hurn Lincs.	Kings Bromley Staffs.	Holbeach Hurn Lincs	Thorpe Constantine Staffs.
Soil type	Fine sandy silt loam	Sandy loam	Fine sandy silt loam	Sandy loam
Planting date	22.05.2012	20.05.2012	01.05.2013	02.05.2013
Application date	25.06.2012	25.06.2012	17.06.2013	16.06.2013
Assessment dates	02.07.2012 – 7DAT 09.07.2012 – 7DAT 15.07.2012 – 20DAT	02.07.2012 – 7DAT 09.07.2012 – 14DAT 16.07.2012 – 21DAT	24.06.2013 – 7DAT 02.07.2013 – 15DAT 08.07.2013 – 21DAT	24.06.2013 – 8DAT 30.06.2013 – 14DAT 07.07.2013 – 21DAT

Diverse locations and trials over two years were necessary to assess the severity of crop effects caused by varying climatic conditions occurring at application and the period following application. Climatic conditions around application are known to affect the degree of crop damage caused by post emergence herbicides on potatoes.

Soil types were predominantly light across the trial sites. However, the rates and timing of herbicide applied, were far more likely to damage varieties by contact activity on the foliage, rather than soil uptake through the roots. No symptoms of root uptake of herbicide were observed for any herbicide, on any variety, during the project.

Varieties were assessed for damage as close as possible to 1, 2 and 3 weeks after application. Crop damage was assessed as % vigour reduction versus the untreated control, foliar necrosis and foliar chlorosis. Vigour reduction is probably the most important measure of crop damage, whilst foliar necrosis and chlorosis are more transitory. The longevity of vigour reduction over the three week assessment period will be an important factor when deciding potential yield reduction caused by a herbicide treatment.

Crop damage was assessed empirically, because “commercially acceptable” damage will vary according to the weed numbers and species present and their impact on yield reduction due to uncontrolled weed growth.

4. Results

All results tables show the range of crop damage observed for the two sites in both 2012 and 2013. Specific damage levels for each site and year are shown in the appendix, together with foliar necrosis and chlorosis levels.

Table 4.1 - Effect of metribuzin (350g ai/ha) on the vigour reduction (as % groundcover reduction versus untreated control) in a range of potato varieties – 7, 14 and 21 DAT.

Variety	7 days after application	14 days after application	21 days after application
Maris Piper	15-30	7-28	13-25
Estima	13-23	7-16	6-9
Markies	3-17	2-5	0-2
Lady Rosetta	3-12	2-8	0-3
Maris peer	12-28	6-18	4-8
Hermes	6-19	4-11	0-5
Melody	16-28	11-17	2-6
Marfona	2-7	1-4	1-6
Harmony	10-28	17-30	3-5
Saturna	1-6	0-3	0
King Edward*	4-5	0-5	0-1
Desiree	3-9	2-7	0-8
Pentland Dell	3-13	2-9	1-7
Saxon	2-4	0-3	0-3
Cabaret	18-64	17-62	4-33
Charlotte	2-13	2-4	0-4
Fontane	0-10	0-5	0-3
Rooster	1-6	0-8	0-1
Russet Burbank	5-12	1-7	0-4
Innovator	33-50	27-57	18-55

*King Edward – results for 2013 only

Table 4.2 - Effect of metribuzin (140g ai/ha) on the vigour reduction (as % groundcover reduction versus untreated control) in a range of potato varieties – 7, 14 and 21 DAT.

Variety	7 days after application	14 days after application	21 days after application
Maris Piper	5-13	5-11	0-7
Estima	1-11	1-8	0-4
Markies	0-2	0-1	0
Lady Rosetta	1-2	0-1	0
Maris peer	2-10	0-8	0-1
Hermes	3-5	0-4	0-1
Melody	4-8	1-7	0-3
Marfona	0-2	0-2	0-2
Harmony	5-12	6-15	0-1
Saturna	0	0	0
King Edward*	1-2	0-1	0
Desiree	0-2	0-2	0
Pentland Dell	0-7	0-5	0-1
Saxon	0-1	0	0-1
Cabaret	12-22	14-20	0-8
Charlotte	0-5	0-1	0-1
Fontane	0-2	0	0-1
Rooster	0-1	0	0
Russet Burbank	0-6	0	0
Innovator	15-25	11-28	7-27

*King Edward – results for 2013 only

Table 4.3 - Effect of bentazone (1440g ai/ha) + Cropspray II E (2.0l/ha) on the vigour reduction (as % groundcover reduction versus untreated control) in a range of potato varieties – 7, 14 and 21 DAT.

Variety	7 days after application	14 days after application	21 days after application
Maris Piper	6-13	5-8	1-5
Estima	4-16	2-7	0-6
Markies	16-58	5-43	2-13
Lady Rosetta	19-25	13-32	0-5
Maris peer	5-13	0-8	0-1
Hermes	2-10	0-6	0
Melody	7-15	2-8	0-1
Marfona	0-5	0-4	0-5
Harmony	1-7	1-7	0-2
Saturna	1-2	0-1	0-1
King Edward*	21-33	15-21	4-5
Desiree	18-37	5-42	2-15
Pentland Dell	2-4	0-5	0-2
Saxon	0-4	0-2	0
Cabaret	5-28	2-18	0-5
Charlotte	5-40	5-18	1-8
Fontane	8-35	5-18	2-8
Rooster	4-13	0-5	0-6
Russet Burbank	4-37	4-19	0-3
Innovator	4-8	3-12	0-7

*King Edward – results for 2013 only

Table 4.4 - Effect of rimsulfuron (12.5g ai/ha) + metribuzin (140g ai/ha) on the vigour reduction (as % groundcover reduction versus untreated control) in a range of potato varieties – 7, 14 and 21 DAT.

Variety	7 days after application	14 days after application	21 days after application
Maris Piper	5-10	5-7	1-7
Estima	1-6	1-4	0-2
Markies	0-2	0	0
Lady Rosetta	1-2	0-2	0-1
Maris peer	2-5	0-4	0-1
Hermes	4-5	0-5	0-2
Melody	4-7	0-6	1-2
Marfona	0-1	0	0-1
Harmony	3-10	7-13	0-3
Saturna	0	0	0
King Edward*	0-3	0-1	0
Desiree	1-2	1-2	0
Pentland Dell	0-2	0-1	0-1
Saxon	0-2	0	0-1
Cabaret	9-20	15-22	3-8
Charlotte	0-3	0	0-1
Fontane	0-2	0	0-1
Rooster	0-1	0	0
Russet Burbank	0-8	0	0
Innovator	17-18	10-32	4-22

*King Edward – results for 2013 only

5. Discussion

Conducting this work over a range of locations and seasons shows the high variability of crop damage which can be expected from the application of post emergence herbicides on potatoes.

The degree of damage from metribuzin is closely related to potato variety. Lower rates of metribuzin clearly result in generally lower levels of crop damage but some varieties show very low tolerance to metribuzin, regardless of the rate applied e.g. Maris Piper, Innovator, Cabaret, Estima and Harmony. The lower rate of metribuzin usually resulted in more transitory damage compared to the higher rate of application.

Crop damage from bentazone was more general across varieties, although some varieties were severely affected e.g. Markies, Lady Rosetta, Desiree, King Edward, Charlotte and Fontane. No manufacturer guidelines, for tolerance to bentazone, exist for many of the varieties tested in this project. Some varieties showed initial damage which later proved to be transitory. Both the initial severity and persistence of symptoms should be used to gauge potential crop yield reduction.

This data does not provide clear guidance about which post emergence herbicide can be safely used on a particular potato variety. A level of crop damage should be expected for all combinations of post emergence herbicides and potato varieties. However, judicious use of this data will help the decision process where a grower/agronomist is faced with weighing-up the effect of weed competition versus herbicide damage on crop yield.

6. Acknowledgements

I would like to thank and acknowledge the following organisations that co-sponsored this work. Agrii H L Hutchinson Limited, Interfarm (UK) Limited, BASF plc, ADAMA Agricultural Solutions UK (formerly Makteshim Agan UK Ltd)

7. Appendix

6.1 Holbeach Hurn 2012 – all results

Table 6.1.1 – Effect of metribuzin (350g ai/ha) on the vigour reduction (as % groundcover versus untreated control), chlorosis (%) and necrosis (%) of a range of potato varieties – 7, 14 and 20 DAT1.

Crop Code	SOLTU BPOT	SOLTU BPOT	SOLTU BPOT	SOLTU BPOT	SOLTU BPOT	SOLTU BPOT	SOLTU BPOT
BBCH Scale							
Crop Scientific Name	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>
Crop Name	Potato	Potato	Potato	Potato	Potato	Potato	Potato
Part Rated	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -
Rating Date	Jul-2-2012	Jul-9-2012	Jul-16-2012	Jul-2-2012	Jul-9-2012	Jul-2-2012	Jul-9-2012
Rating Type	Vigour reduction	Vigour reduction	Vigour reduction	Chlorosis	Chlorosis	Necrosis	Necrosis
Rating Unit	%	%	%	%	%	%	%
No. Name	1	2	3	4	5	6	7
2Maris piper	23.3cd	28.3b	21.7a	10.7c-f	5.0c	12.7ef	8.3e-h
7Estima	13.3e-j	11.0e-h	6.7cd	8.3d-g	0.0g	6.7g-l	6.7g-j
12Markies	7.3j-p	5.3k-o	0.0j	0.0h	0.0g	6.7g-l	2.7i-q
17Lady rosetta	10.0g-m	6.7i-m	0.0j	7.0e-h	1.7d-g	3.3j-n	2.0m-q
22Maris peer	23.3cd	15.0d	4.0efg	13.3b-e	3.3c-f	10.0fgh	7.3f-j
27Hermes	16.0d-h	5.0k-p	0.0j	4.7fgh	0.0g	9.0f-i	4.0i-o
32Melody	20.0de	13.3def	4.0efg	19.3b	15.0a	7.7g-j	4.0i-o
37Marfona	7.0j-p	1.7n-r	0.7ij	7.7d-h	0.0g	2.7j-n	2.3m-q
42Harmony	28.3bc	28.3b	5.0de	17.3bc	0.0g	11.0fg	11.7d
47Saturna	4.0k-p	3.0m-r	0.0j	0.0h	0.0g	2.3k-n	1.3n-q
57Desiree	9.0h-n	7.3h-l	7.7c	4.7fgh	5.0c	4.7i-n	2.0m-q
62Pentland Dell	11.0f-l	2.3n-r	3.0e-i	3.0fgh	1.3efg	5.0i-n	2.7l-q
67Saxon	4.0k-p	0.7qr	2.0f-j	0.0h	0.0g	2.3k-n	0.7pq
72Cabaret	55.0a	35.0a	16.7b	10.0def	3.3c-f	40.0a	21.7a
77Charlotte	13.3e-j	1.7n-r	4.0efg	0.0h	0.0g	12.7ef	2.7l-q
82Fontane	10.0g-m	5.0k-p	1.7g-j	1.3gh	2.7c-g	10.3fgh	3.0k-q
87Rooster	5.0k-p	8.3g-k	0.7ij	0.0h	0.0g	5.0i-n	4.3i-n
92Russet burbank	11.7f-k	1.7n-r	2.3f-j	28.3a	10.0b	3.7j-n	0.0q
97Innovator	33.3b	26.7b	23.3a	15.0bcd	1.7d-g	20.0cd	15.0c
LSD (P=.05)	6.29	3.25	2.11	6.24	2.26	4.09	2.65
Standard Deviation	3.89	2.01	1.30	3.86	1.40	2.53	1.64
CV	54.71	48.25	93.02	134.02	148.63	55.43	54.67
Replicate F	1.371	2.780	1.310	0.908	5.897	1.475	3.141
Replicate Prob(F)	0.2567	0.0651	0.2728	0.4055	0.0034	0.2318	0.0459
Treatment F	18.056	38.638	26.685	5.350	7.541	21.828	24.320
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

Table 6.1.2 – Effect of metribuzin (140g ai/ha) on the vigour reduction (as % groundcover versus untreated control), chlorosis (%) and necrosis (%) of a range of potato varieties – 7, 14 and 20 DAT1.

Crop Code	SOLTU B POT	SOLTU B POT	SOLTU B POT	SOLTU B POT	SOLTU B POT	SOLTU B POT	SOLTU B POT
BBCH Scale	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>
Crop Scientific Name	Potato	Potato	Potato	Potato	Potato	Potato	Potato
Crop Name	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -
Part Rated	Jul-2-2012	Jul-9-2012	Jul-16-2012	Jul-2-2012	Jul-9-2012	Jul-2-2012	Jul-9-2012
Rating Date	Vigour reduction	Vigour reduction	Vigour reduction	Chlorosis	Chlorosis	Necrosis	Necrosis
Rating Type	%	%	%	%	%	%	%
Rating Unit	1	2	3	4	5	6	7
No. Name							
3 Maris piper	6.0j-p	5.0k-p	0.0j	4.7fgh	0.0g	1.7lmn	5.0i-m
8 Estima	1.0nop	1.0pqr	0.0j	0.0h	0.0g	1.0mn	0.0q
13 Markies	0.0p	1.0pqr	0.0j	0.0h	0.0g	0.0n	0.0q
18 Lady rosetta	1.3nop	1.3o-r	0.0j	0.3h	0.0g	1.0mn	0.0q
23 Maris peer	4.0k-p	0.0r	0.0j	1.7gh	0.0g	2.3k-n	1.3n-q
28 Hermes	3.0m-p	0.0r	0.0j	0.0h	0.0g	1.7lmn	0.0q
33 Melody	4.0k-p	0.7qr	0.0j	3.0fgh	5.0c	2.7j-n	3.7h-l
38 Marfona	0.0p	0.0r	0.0j	0.0h	0.0g	0.0n	0.0q
43 Harmony	6.7j-p	9.3g-j	0.0j	5.0fgh	0.0g	0.0n	5.7h-l
48 Saturna	0.0p	0.0r	0.0j	0.0h	0.0g	0.0n	0.0q
58 Desiree	0.7op	1.7n-r	0.0j	0.0h	4.3cd	0.0n	0.7pq
63 Pentland Dell	1.7nop	0.0r	0.0j	0.0h	0.3g	1.7lmn	0.0q
68 Saxon	1.3nop	0.0r	0.0j	0.0h	0.0g	1.3mn	0.0q
73 Cabaret	18.3def	14.3de	0.0j	1.7gh	1.7d-g	16.7de	11.0de
78 Charlotte	5.0k-p	0.0r	0.0j	0.0h	0.0g	4.3i-n	0.0q
83 Fontane	1.7nop	0.0r	0.0j	0.0h	0.0g	1.7lmn	0.0q
88 Rooster	0.7op	0.0r	0.0j	0.0h	0.0g	1.0mn	0.0q
93 Russet burbank	6.3j-p	0.0r	0.0j	5.0fgh	1.7d-g	1.3mn	0.0q
98 Innovator	15.0e-i	11.0e-h	7.3c	3.3fgh	0.0g	10.7fgh	8.7d-h
LSD (P=.05)	6.29	3.25	2.11	6.24	2.26	4.09	2.65
Standard Deviation	3.89	2.01	1.30	3.86	1.40	2.53	1.64
CV	54.71	48.25	93.02	134.02	148.63	55.43	54.67
Replicate F	1.371	2.780	1.310	0.908	5.897	1.475	3.141
Replicate Prob(F)	0.2567	0.0651	0.2728	0.4055	0.0034	0.2318	0.0459
Treatment F	18.056	38.638	26.685	5.350	7.541	21.828	24.320
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

Table 6.1.3 – Effect of bentazone (1440g ai/ha) + Cropspray 11E (2.0l/ha) on the vigour reduction (as % groundcover versus untreated control), chlorosis (%) and necrosis (%) of a range of potato varieties – 7, 14 and 20 DAT1.

Crop Code	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU
BBCH Scale	B POT	B POT	B POT	B POT	B POT	B POT	B POT
Crop Scientific Name	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>
Crop Name	Potato	Potato	Potato	Potato	Potato	Potato	Potato
Part Rated	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -
Rating Date	Jul-2-2012	Jul-9-2012	Jul-16-2012	Jul-2-2012	Jul-9-2012	Jul-2-2012	Jul-9-2012

Rating Type Rating Unit No. Name	Vigour reduction % 1	Vigour reduction % 2	Vigour reduction % 3	Chlorosis % 4	Chlorosis % 5	Necrosis % 6	Necrosis % 7
4Maris piper	6.3j-p	5.0k-p	0.7ij	0.0h	0.0g	2.0k-n	2.0m-q
9Estima	6.7j-p	5.7j-n	0.0j	0.0h	0.0g	6.0h-m	5.7h-l
14Markies	31.7b	21.7c	1.7g-j	6.7e-h	0.0g	26.7b	16.7bc
19Lady rosetta	23.3cd	20.0c	0.0j	3.3fgh	0.0g	18.3cd	18.3b
24Maris peer	5.0k-p	0.0r	0.0j	0.0h	0.0g	3.3i-n	0.0q
29Hermes	4.3k-p	0.0r	0.0j	0.0h	0.0g	6.0h-m	1.0opq
34Melody	8.0i-p	2.3n-r	0.0j	3.3fgh	3.7cde	4.3i-n	3.0k-q
39Marfona	0.0p	0.0r	0.0j	0.0h	0.0g	0.0n	1.0opq
44Harmony	6.7j-p	4.7k-q	0.0j	0.0h	2.7c-g	6.7g-l	2.3m-q
49Saturna	1.7nop	0.0r	0.0j	0.0h	1.0efg	0.0n	0.0opq
59Desiree	18.3def	5.0k-p	1.7g-j	5.0fgh	3.7cde	13.3ef	4.7i-m
64Pentland Dell	4.3k-p	0.0r	0.0j	0.0h	0.0g	4.3i-n	0.0opq
69Saxon	4.0k-p	0.0r	0.0j	1.7gh	0.0g	1.3mn	0.0opq
74Cabaret	5.0k-p	2.3n-r	0.0j	0.0h	1.3efg	3.7i-n	4.3i-n
79Charlotte	22.7cd	11.7d-g	4.3ef	0.0h	0.0g	17.7d	10.0def
84Fontane	27.7bc	13.3def	1.7g-j	1.7gh	0.0g	22.7bc	15.0c
89Rooster	7.0j-p	3.3m-r	0.0j	0.0h	0.0g	7.0g-k	3.3k-q
94Russet burbank	20.0de	4.0l-r	0.7ij	20.0b	1.7d-g	9.0f-i	4.3i-n
99Innovator	6.0j-p	4.7k-q	0.0j	1.7gh	0.0g	4.0i-n	5.7h-l
LSD (P=.05)	6.29	3.25	2.11	6.24	2.26	4.09	2.65
Standard Deviation	3.89	2.01	1.30	3.86	1.40	2.53	1.64
CV	54.71	48.25	93.02	134.02	148.63	55.43	54.67
Replicate F	1.371	2.780	1.310	0.908	5.897	1.475	3.141
Replicate Prob(F)	0.2567	0.0651	0.2728	0.4055	0.0034	0.2318	0.0459
Treatment F	18.056	38.638	26.685	5.350	7.541	21.828	24.320
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

Table 6.1.4 – Effect of rimsulfuron (12.5g ai/ha) + metribuzin (140g/ha) on the vigour reduction (as % groundcover versus untreated control), chlorosis (%) and necrosis (%) of a range of potato varieties – 7, 14 and 20 DAT1.

Crop Code BBCH Scale Crop Scientific Name Crop Name Part Rated Rating Date Rating Type Rating Unit No. Name	SOLTU BPOT Solanum tubero> Potato LEAF - Jul-2-2012 Vigour reduction %	SOLTU BPOT Solanum tubero> Potato LEAF - Jul-9-2012 Vigour reduction %	SOLTU BPOT Solanum tubero> Potato LEAF - Jul-16-2012 Vigour reduction %	SOLTU BPOT Solanum tubero> Potato LEAF - Jul-2-2012 Chlorosis %	SOLTU BPOT Solanum tubero> Potato LEAF - Jul-9-2012 Chlorosis %	SOLTU BPOT Solanum tubero> Potato LEAF - Jul-2-2012 Necrosis %	SOLTU BPOT Solanum tubero> Potato LEAF - Jul-9-2012 Necrosis %
	1	2	3	4	5	6	7
5Maris piper	5.0k-p	4.7k-q	0.7ij	8.0d-h	0.0g	0.0n	6.0h-k
10Estima	1.3nop	0.7qr	0.0j	0.3h	0.7fg	1.0mn	0.0q
15Markies	1.0nop	0.3r	0.0j	0.0h	0.0g	1.0mn	0.0q
20Lady rosetta	1.3nop	0.0r	0.0j	3.7fgh	0.0g	0.0n	0.0q
25Maris peer	4.0k-p	0.0r	0.0j	3.3fgh	0.0g	2.3k-n	1.3n-q

30Hermes	3.7l-p	0.0r	0.0j	3.3fgh	0.0g	1.7lmn	0.0q
35Melody	4.3k-p	0.0r	1.0hij	8.3d-g	5.0c	2.3k-n	1.3n-q
40Marfona	0.0p	0.0r	0.0j	0.0h	0.0g	0.0n	0.0q
45Harmony	7.3j-p	8.3g-k	3.3e-h	8.3d-g	0.0g	0.0n	8.3e-h
50Saturna	0.0p	0.0r	0.0j	0.0h	0.0g	0.0n	0.0q
60Desiree	2.3m-p	1.7n-r	0.0j	3.3fgh	3.3c-f	0.0n	0.7pq
65Pentland Dell	1.7nop	0.0r	0.0j	0.0h	0.3g	1.7lmn	0.0q
70Saxon	1.3nop	0.0r	1.0hij	0.0h	0.0g	1.3mn	0.0q
75Cabaret	20.0de	14.7de	1.7g-j	1.7gh	1.7d-g	18.3cd	11.3de
80Charlotte	3.3l-p	0.0r	0.0j	0.0h	0.0g	3.0i-n	0.0q
85Fontane	1.7nop	0.0r	0.0j	1.7gh	0.0g	1.7lmn	11.3de
90Rooster	1.3nop	0.0r	0.0j	0.0h	0.0g	2.3k-n	0.0q
95Russet burbank	8.3i-o	0.0r	0.0j	10.0def	2.3c-g	3.3i-n	0.0q
100Innovator	17.3d-g	10.0f-i	4.0efg	3.0fgh	0.0g	12.7ef	9.3d-g
LSD (P=.05)	6.29	3.25	2.11	6.24	2.26	4.09	2.65
Standard Deviation	3.89	2.01	1.30	3.86	1.40	2.53	1.64
CV	54.71	48.25	93.02	134.02	148.63	55.43	54.67
Replicate F	1.371	2.780	1.310	0.908	5.897	1.475	3.141
Replicate Prob(F)	0.2567	0.0651	0.2728	0.4055	0.0034	0.2318	0.0459
Treatment F	18.056	38.638	26.685	5.350	7.541	21.828	24.320
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

6.2 Kings Bromley 2012 – all results

Table 6.2.1 – Effect of metribuzin (350g ai/ha) on the vigour reduction (as % groundcover versus untreated control), chlorosis (%) and necrosis (%) of a range of potato varieties – 7, 14 and 21 DAT1.

Crop Code	SOLTU BPOT	SOLTU BPOT	SOLTU BPOT	SOLTU BPOT	SOLTU BPOT	SOLTU BPOT	SOLTU BPOT
BBCH Scale	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>
Crop Scientific Name	Potato	Potato	Potato	Potato	Potato	Potato	Potato
Crop Name	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -
Part Rated	Jul-2-2012	Jul-9-2012	Jul-16-2012	Jul-2-2012	Jul-9-2012	Jul-2-2012	Jul-9-2012
Rating Date	Vigour reduction	Vigour reduction	Vigour reduction	Chlorosis	Chlorosis	Necrosis	Necrosis
Rating Type	%	%	%	%	%	%	%
Rating Unit	1	2	3	4	5	6	7
No. Name							
2 Maris piper	30.0c-f	25.0de	25.0c	46.7b	11.7bc	9.0h-l	11.7ef
7 Estima	23.3fgh	8.3i-l	8.3ef	18.3fg	2.7h-k	7.7i-n	3.7hi
12 Markies	16.7h-k	5.0klm	1.7gh	1.7j	0.0k	7.7i-n	5.3ghi
17 Lady rosetta	11.7i-l	7.7j-m	2.7fgh	5.0hij	6.7efg	1.7mno	0.7i
22 Maris peer	18.3g-j	6.0j-m	6.0fgh	20.0ef	3.3g-k	7.0i-o	3.3hi
27 Hermes	19.3ghi	6.0j-m	4.7fgh	7.0g-j	3.7f-k	6.7i-o	2.0i
32 Melody	28.3d-g	15.0f-i	5.3fgh	60.0a	15.7a	20.0def	4.3hi
37 Marfona	4.3lm	0.7lm	2.0gh	3.3ij	5.0e-i	0.0o	0.0i
42 Harmony	18.3g-j	30.0cd	3.3fgh	30.0de	11.7bc	9.3h-k	15.0de
47 Saturna	6.0klm	0.0m	0.0h	2.3j	0.0k	0.0o	0.0i
57 Desiree	3.7lm	2.0lm	4.7fgh	5.0hij	3.3g-k	0.7no	0.0i

62	Pentland Dell	3.3lm	2.0lm	1.0gh	2.7j	4.7e-j	0.0o	0.0i
67	Saxon	3.3lm	0.0m	1.7gh	0.0j	0.0k	0.0o	0.0i
72	Cabaret	64.0a	61.7a	33.3b	15.0f-i	3.3g-k	36.7a	36.7a
77	Charlotte	3.3lm	0.0m	1.7gh	0.0j	0.0k	1.7mno	0.0i
82	Fontane	0.0m	1.3lm	2.7fgh	0.0j	0.0k	0.0o	1.0i
87	Rooster	1.0lm	0.0m	0.0h	0.0j	0.0k	0.0o	0.0i
92	Russet burbank	4.7lm	1.7lm	4.3fgh	5.0hij	2.0ijk	0.0o	0.0i
97	Innovator	50.0b	56.7a	55.0a	8.3f-j	0.0k	33.3ab	25.0c
LSD (P=.05)		9.03	6.20	4.92	9.59	3.23	5.74	
Standard Deviation		5.58	3.84	3.05	5.93	2.00	3.55	
CV		65.46	58.23	88.02	115.32	94.95	75.18	
Replicate F		4.636	9.654	1.442	5.772	0.572	1.304	
Replicate Prob(F)		0.0110	0.0001	0.2395	0.0038	0.5657	0.2744	
Treatment F		17.081	32.118	21.066	9.689	10.590	16.722	
Treatment Prob(F)		0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

Table 6.2.2 – Effect of metribuzin (140g ai/ha) on the vigour reduction (as % groundcover versus untreated control), chlorosis (%) and necrosis (%) of a range of potato varieties – 7, 14 and 21 DAT1.

Crop Code	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	
BBCH Scale	BPOT	BPOT	BPOT	BPOT	BPOT	BPOT	BPOT	
Crop Scientific Name	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	
Crop Name	Potato	Potato	Potato	Potato	Potato	Potato	Potato	
Part Rated	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	
Rating Date	Jul-2-2012	Jul-9-2012	Jul-16-2012	Jul-2-2012	Jul-9-2012	Jul-2-2012	Jul-9-2012	
Rating Type	Vigour reduction	Vigour reduction	Vigour reduction	Chlorosis	Chlorosis	Necrosis	Necrosis	
Rating Unit	%	%	%	%	%	%	%	
Number of Subsamples	1	1	1	1	1	1	1	
No. Name	1	2	3	4	5	6	7	
3	Maris piper	5.0lm	6.0j-m	1.7gh	12.0f-j	4.3f-j	3.3k-o	1.7i
8	Estima	1.7lm	1.7lm	1.0gh	0.0j	0.7jk	0.0o	0.7i
13	Markies	1.7lm	0.0m	0.0h	0.0j	0.0k	0.7no	0.0i
18	Lady rosetta	1.3lm	0.0m	0.0h	0.0j	0.0k	0.0o	0.0i
23	Maris peer	5.7klm	1.7lm	0.0h	3.3ij	1.3ijk	0.0o	0.3i
28	Hermes	3.3lm	0.0m	0.0h	3.3ij	0.0k	3.0k-o	0.0i
33	Melody	6.0klm	1.0lm	0.7gh	33.3cd	10.7bcd	9.3h-k	0.0i
38	Marfona	0.0m	0.0m	0.0h	0.0j	0.0k	0.0o	0.0i
43	Harmony	11.7i-l	15.0f-i	0.7gh	6.7g-j	7.3def	3.7j-o	3.3hi
48	Saturna	0.0m	0.0m	0.0h	0.0j	0.0k	0.0o	0.0i
58	Desiree	1.7lm	0.0m	0.0h	0.0j	0.0k	0.7no	0.0i
63	Pentland Dell	0.0m	0.0m	0.0h	0.0j	1.7ijk	0.0o	0.0i
68	Saxon	0.0m	0.0m	0.7gh	0.0j	0.0k	0.0o	0.0i
73	Cabaret	18.3g-j	20.0efg	8.3ef	10.0f-j	1.7ijk	13.3ghi	15.0de
78	Charlotte	0.0m	0.0m	0.0h	0.0j	0.0k	0.0o	0.0i
83	Fontane	0.0m	0.0m	0.7gh	0.0j	0.0k	0.0o	0.0i
88	Rooster	0.0m	0.0m	0.0h	0.0j	0.0k	0.0o	0.0i
93	Russet burbank	0.0m	0.0m	0.0h	0.0j	0.7jk	0.0o	0.0i

98 Innovator	25.0e-h	28.3cd	26.7c	8.3f-j	0.0k	20.0def	13.3de
LSD (P=.05)	9.03	6.20	4.92	9.59	3.23	5.74	4.38
Standard Deviation	5.58	3.84	3.05	5.93	2.00	3.55	2.71
CV	65.46	58.23	88.02	115.32	94.95	75.18	77.13
Replicate F	4.636	9.654	1.442	5.772	0.572	1.304	6.047
Replicate Prob(F)	0.0110	0.0001	0.2395	0.0038	0.5657	0.2744	0.0029
Treatment F	17.081	32.118	21.066	9.689	10.590	16.722	22.306
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

Table 6.2.3 – Effect of bentazone (1440g ai/ha) + Cropspray 11E (2.0l/ha) on the vigour reduction (as % groundcover versus untreated control), chlorosis (%) and necrosis (%) of a range of potato varieties – 7, 14 and 21 DAT1.

Crop Code	SOLTU B POT	SOLTU B POT	SOLTU B POT	SOLTU B POT	SOLTU B POT	SOLTU B POT	SOLTU B POT
BBCH Scale	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>
Crop Scientific Name	Potato	Potato	Potato	Potato	Potato	Potato	Potato
Crop Name	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -
Part Rated	Jul-2-2012	Jul-9-2012	Jul-16-2012	Jul-2-2012	Jul-9-2012	Jul-2-2012	Jul-9-2012
Rating Date	Vigour reduction	Vigour reduction	Vigour reduction	Chlorosis	Chlorosis	Necrosis	Necrosis
Rating Type	%	%	%	%	%	%	%
Rating Unit	1	2	3	4	5	6	7
No. Name							
4Maris piper	11.7i-l	8.3i-l	3.0fgh	1.7j	8.3cde	5.0j-o	3.3hi
9Estima	6.7klm	2.3lm	5.7fgh	0.0j	0.0k	4.7j-o	2.3i
14Markies	58.3ab	43.3b	13.3de	3.3ij	0.0k	38.3a	30.0b
19Lady rosetta	25.0e-h	31.7cd	4.7fgh	16.7fgh	11.7bc	15.0fgh	18.3d
24Maris peer	10.0i-m	7.3j-m	0.0h	2.0j	1.0ijk	3.3k-o	1.7i
29Hermes	10.0i-m	1.7lm	0.0h	0.0j	0.0k	6.0j-o	1.0i
34Melody	10.3i-m	5.0klm	1.3gh	0.0j	8.3cde	5.7j-o	0.0i
39Marfona	4.7lm	3.7lm	4.7fgh	0.0j	0.0k	1.0no	3.3hi
44Harmony	7.3j-m	3.7lm	1.0gh	0.0j	2.7h-k	6.0j-o	1.0i
49Saturna	0.7lm	0.0m	0.0h	0.0j	0.0k	0.0o	0.0i
59Desiree	36.7cd	41.7b	15.0d	15.0f-i	16.7a	25.0cd	18.3d
64Pentland Dell	2.3lm	5.0klm	1.7gh	0.0j	4.0f-k	1.7mno	1.0i
69Saxon	4.0lm	1.7lm	0.0h	0.0j	0.0k	2.3k-o	1.0i
74Cabaret	28.3d-g	16.7fgh	1.0gh	10.0f-j	1.7ijk	16.7efg	8.3fgh
79Charlotte	40.0c	16.7fgh	8.3ef	0.0j	0.0k	21.7de	15.0d
84Fontane	35.0cde	33.3c	16.7d	1.7j	0.0k	28.3bc	30.0b
89Rooster	8.7i-m	0.0m	6.0fgh	0.0j	6.0e-h	6.3j-o	1.0i
94Russet burbank	36.7cd	11.7h-k	3.0fgh	41.7bc	1.7ijk	16.7efg	10.0efg
99Innovator	8.0j-m	11.7h-k	6.7fg	0.0j	1.0ijk	6.0j-o	7.7fgh
LSD (P=.05)	9.03	6.20	4.92	9.59	3.23	5.74	4.38
Standard Deviation	5.58	3.84	3.05	5.93	2.00	3.55	2.71
CV	65.46	58.23	88.02	115.32	94.95	75.18	77.13

Replicate F	4.636	9.654	1.442	5.772	0.572	1.304	6.047
Replicate Prob(F)	0.0110	0.0001	0.2395	0.0038	0.5657	0.2744	0.0029
Treatment F	17.081	32.118	21.066	9.689	10.590	16.722	22.306
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

Table 6.2.4 – Effect of rimsulfuron (12.5g ai/ha) + metribuzin (140g/ha) on the vigour reduction (as % groundcover versus untreated control), chlorosis (%) and necrosis (%) of a range of potato varieties – 7, 14 and 21 DAT1.

Crop Code	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU
BBCH Scale	BPOT	BPOT	BPOT	BPOT	BPOT	BPOT	BPOT
Crop Scientific Name	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>
Crop Name	Potato	Potato	Potato	Potato	Potato	Potato	Potato
Part Rated	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -
Rating Date	Jul-2-2012	Jul-9-2012	Jul-16-2012	Jul-2-2012	Jul-9-2012	Jul-2-2012	Jul-9-2012
Rating Type	Vigour reduction	Vigour reduction	Vigour reduction	Chlorosis	Chlorosis	Necrosis	Necrosis
Rating Unit	%	%	%	%	%	%	%
No. Name	1	2	3	4	5	6	7
5Maris piper	5.0lm	5.0klm	2.3fgh	16.7fgh	5.0e-i	3.3k-o	1.7i
10Estima	1.7lm	1.7lm	0.0h	0.0j	1.7ijk	0.0o	0.3i
15Markies	1.7lm	0.0m	0.0h	0.0j	0.0k	0.7no	0.0i
20Lady rosetta	1.7lm	0.0m	0.0h	1.0j	0.0k	0.0o	0.0i
25Maris peer	4.7lm	1.7lm	0.0h	8.3f-j	1.3ijk	0.0o	0.7i
30Hermes	3.3lm	1.7lm	0.0h	8.3f-j	0.0k	1.7mno	0.0i
35Melody	7.0klm	1.0lm	0.7gh	30.0de	13.3ab	8.3h-m	0.0i
40Marfona	0.0m	0.0m	0.0h	0.0j	0.0k	0.0o	0.0i
45Harmony	10.0i-m	13.3g-j	0.0h	5.0hij	7.0efg	2.0i-o	3.3hi
50Saturna	0.0m	0.0m	0.0h	0.0j	0.0k	0.0o	0.0i
60Desiree	1.7lm	0.0m	0.0h	0.0j	0.0k	0.3o	0.0i
65Pentland Dell	0.0m	0.0m	0.0h	0.0j	1.7ijk	0.0o	0.0i
70Saxon	1.7lm	0.0m	0.0h	0.0j	0.0k	0.0o	0.0i
75Cabaret	18.3g-j	21.7ef	8.3ef	8.3f-j	1.7ijk	13.3ghi	18.3d
80Charlotte	0.0m	0.0m	0.0h	0.0j	0.0k	0.0o	0.0i
85Fontane	0.0m	0.0m	0.0h	1.7j	1.7ijk	0.0o	0.0i
90Rooster	0.0m	0.0m	0.0h	0.0j	0.0k	0.0o	0.0i
95Russet burbank	0.0m	0.0m	0.0h	1.7j	0.7jk	3.3k-o	0.0i
100Innovator	18.3g-j	31.7ed	21.7c	8.3f-j	1.0ijk	10.7g-j	13.3de
LSD (P=.05)	9.03	6.20	4.92	9.59	3.23	5.74	4.38
Standard Deviation	5.58	3.84	3.05	5.93	2.00	3.55	2.71
CV	65.46	58.23	88.02	115.32	94.95	75.18	77.13
Replicate F	4.636	9.654	1.442	5.772	0.572	1.304	6.047
Replicate Prob(F)	0.0110	0.0001	0.2395	0.0038	0.5657	0.2744	0.0029
Treatment F	17.081	32.118	21.066	9.689	10.590	16.722	22.306
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

6.3 Holbeach Hurn 2013 – all results

Table 6.3.1 – Effect of metribuzin (350g ai/ha) on the vigour reduction (as % groundcover reduction versus untreated control), chlorosis (%) and necrosis (%) of a range of potato varieties – 7, 15 and 21 DAT1.

Crop Code	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU
Crop Scientific Name	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>
Crop Name	Potato	Potato	Potato	Potato	Potato	Potato	Potato
Part Rated	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -
Rating Date	Jun-24-2013	Jul-2-2013	Jul-8-2013	Jun-24-2013	Jul-2-2013	Jun-24-2013	Jul-2-2013
Rating Type	VIGRED	VIGRED	VIGRED	PHYNEC	PHYNEC	PHYCHL	PHYCHL
Rating Unit	%RELB	%RELB	%RELB	%	%	%	%
Trt Treatment							
No. Name	1	2	3	4	5	6	7
2Maris piper	22.7def	16.0d-g	13.3b	0.0w	9.0fgh	25.0b	13.3ab
7Estima	23.3cde	14.7efg	5.7cde	6.7i-o	14.0bcd	20.0b-e	0.0j
12Markies	9.0o-u	4.0n-t	0.0j	2.7p-w	2.7l-q	1.0opq	0.0j
17Lady rosetta	5.0r-y	2.3p-u	2.7e-j	0.7uvw	0.0q	3.0l-q	1.0hij
22Maris peer	28.3bc	18.3cd	4.3c-h	11.7efg	16.7b	11.7f-k	0.0j
27Hermes	16.7g-l	10.7ij	1.0hij	9.3f-j	10.7efg	7.7h-p	0.0j
32Melody	15.7h-n	11.0hij	2.0f-j	4.3m-t	4.7j-n	20.7bcd	14.0a
37Marfona	2.0wxy	4.3m-s	1.3g-j	0.7uvw	0.7pq	0.0q	1.3hij
42Harmony	10.0m-s	16.7def	3.7d-i	5.3l-r	15.0bc	8.3g-n	0.0j
47Saturna	5.0r-y	0.0u	0.0j	0.0w	0.0q	3.0l-q	0.0j
52King Edward	5.3r-y	5.0l-q	0.0j	0.0w	0.0q	5.3j-q	3.3ghi
57Desiree	3.7t-y	3.7o-u	1.3g-j	0.0w	0.0q	3.7l-q	3.7gh
62Pentland Dell	13.3j-p	9.3jk	7.0c	3.7o-v	4.7j-n	10.0f-l	1.7hij
67Saxon	4.3s-y	0.0u	0.0j	0.0w	0.0q	0.0q	0.0j
72Cabaret	32.7ab	30.7a	10.7b	18.3b	21.7a	14.3d-h	0.0j
77Charlotte	7.0q-x	2.3p-u	0.0j	3.0p-w	1.3opq	3.0l-q	0.0j
82Fontane	3.3u-y	1.0r-u	0.0j	0.0w	0.0q	3.3l-q	1.0hij
87Rooster	2.7v-y	1.3q-u	0.0j	0.0w	0.0q	2.7m-q	2.7g-j
92Russet burbank	6.3q-y	1.3q-u	0.0j	3.3o-w	0.7pq	11.7f-k	0.0j
97Innovator	36.7a	31.7a	18.3a	21.7a	23.3a	9.3g-m	3.3ghi
LSD (P=.05)	4.97	3.09	2.74	2.84	2.68	5.65	2.44
Standard Deviation	3.07	1.91	1.70	1.76	1.66	3.49	1.51
CV	42.72	37.52	96.49	57.49	44.61	53.62	94.9
Replicate F	5.571	0.085	0.767	0.488	3.551	3.288	2.530
Replicate Prob(F)	0.0046	0.9188	0.4662	0.6148	0.0310	0.0399	0.0828
Treatment F	24.427	39.877	12.154	22.746	32.706	13.441	14.120
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

Table 6.3.2 – Effect of metribuzin (140g ai/ha) on the vigour reduction (as % groundcover reduction versus untreated control), chlorosis (%) and necrosis (%) of a range of potato varieties – 7, 15 and 21 DAT1.

Crop Code	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU
Crop Scientific Name	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>
Crop Name	Potato	Potato	Potato	Potato	Potato	Potato	Potato
Part Rated	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -
Rating Date	Jun-24-2013	Jul-2-2013	Jul-8-2013	Jun-24-2013	Jul-2-2013	Jun-24-2013	Jul-2-2013
Rating Type	VIGRED	VIGRED	VIGRED	PHYNEC	PHYNEC	PHYCHL	PHYCHL
Rating Unit	%RELB	%RELB	%RELB	%	%	%	%
Trt Treatment							
No. Name	1	2	3	4	5	6	7
3Maris piper	13.3j-p	11.0hij	7.3c	0.0w	5.7i-l	16.7c-f	8.3de
8Estima	11.0l-r	7.7j-n	3.0e-j	2.3q-w	8.0ghi	10.0f-l	0.0j
13Markies	1.7xy	1.0r-u	0.0j	1.0t-w	0.3q	1.0opq	0.7hij
18Lady rosetta	2.0wxy	0.3tu	0.0j	0.0w	0.0q	3.3l-q	0.3ij
23Maris peer	9.7n-t	7.7j-n	0.7ij	5.7k-q	5.7i-l	2.3m-q	2.3g-j
28Hermes	5.3r-y	3.7o-u	0.7ij	3.3o-w	3.7k-p	2.3m-q	0.0j
33Melody	8.0p-w	7.0k-o	1.3g-j	3.3o-w	2.7l-q	16.7c-f	12.3ab
38Marfona	0.7y	0.0u	0.0j	0.0w	0.0q	0.7pq	0.0j
43Harmony	5.0r-y	6.3k-o	0.3ij	0.0w	5.3i-m	6.7i-q	1.0hij
48Saturna	0.0y	0.0u	0.0j	0.0w	0.0q	0.0q	0.0j
53King Edward	1.7xy	1.0r-u	0.0j	0.0w	0.0q	3.0l-q	3.3ghi
58Desiree	1.7xy	0.7stu	0.0j	0.0w	0.0q	3.0l-q	2.7g-j
63Pentland Dell	7.0q-x	5.0l-q	0.7ij	2.7p-w	1.3opq	3.7l-q	1.0hij
68Saxon	0.0y	0.0u	0.0j	0.0w	0.0q	0.0q	0.0j
73Cabaret	21.7d-g	18.3cd	7.0c	15.0cd	16.7b	5.0k-q	0.0j
78Charlotte	0.0y	0.7stu	0.0j	0.0w	0.3q	0.0q	0.0j
83Fontane	0.0y	0.0u	0.0j	0.0w	0.0q	0.0q	0.0j
88Rooster	0.0y	0.0u	0.0j	0.0w	0.0q	0.7pq	0.7hij
93Russet burbank	2.7v-y	0.3tu	0.0j	0.3vw	0.0q	3.0l-q	0.3ij
98Innovator	25.0cd	23.3b	12.0b	15.0cd	13.3cde	16.7c-f	0.0j
LSD (P=.05)	4.97	3.09	2.74	2.84	2.68	5.65	2.44
Standard Deviation	3.07	1.91	1.70	1.76	1.66	3.49	1.51
CV	42.72	37.52	96.49	57.49	44.61	53.62	94.9
Replicate F	5.571	0.085	0.767	0.488	3.551	3.288	2.530
Replicate Prob(F)	0.0046	0.9188	0.4662	0.6148	0.0310	0.0399	0.0828
Treatment F	24.427	39.877	12.154	22.746	32.706	13.441	14.120
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

Table 6.3.3 – Effect of bentazone (1440g ai/ha) + Cropspray 11E (2.0l/ha) on the vigour reduction (as % groundcover reduction versus untreated control), chlorosis (%) and necrosis (%) of a range of potato varieties – 7, 15 and 21 DAT1.

Crop Code	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU
Crop Scientific Name	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>
Crop Name	Potato	Potato	Potato	Potato	Potato	Potato	Potato
Crop Variety	Various	Various	Various	Various	Various	Various	Various
Rating Date	Jun-24-2013	Jul-2-2013	Jul-8-2013	Jun-24-2013	Jul-2-2013	Jun-24-2013	Jul-2-2013
Rating Type	VIGRED	VIGRED	VIGRED	PHYNEC	PHYNEC	PHYCHL	PHYCHL
Rating Unit	%RELB	%RELB	%RELB	%	%	%	%
Trt Treatment							
No. Name	1	2	3	4	5	6	7
4Maris piper	13.3j-p	5.3l-p	5.0c-f	3.7o-v	2.7l-q	21.7bc	3.7gh
9Estima	16.0g-m	6.7k-o	1.7f-j	4.7m-s	6.7h-k	3.3l-q	0.0j
14Markies	15.0i-o	4.7m-r	3.3e-j	10.0e-i	4.7j-n	0.7pq	0.0j
19Lady rosetta	19.0e-j	13.0ghi	0.0j	13.0de	11.3def	5.0k-q	2.3g-j
24Maris peer	13.0j-p	8.0j-m	0.0j	8.3h-l	8.0ghi	3.3l-q	0.0j
29Hermes	10.0m-s	5.7k-p	0.0j	6.0j-p	5.7i-l	1.7n-q	0.0j
34Melody	15.0i-o	7.7j-n	0.0j	4.3m-t	3.3l-q	14.0d-h	10.7bcd
39Marfona	4.0s-y	2.0p-u	0.0j	2.0r-w	1.3opq	0.7pq	0.7hij
44Harmony	5.7q-y	6.7k-o	1.7f-j	4.0n-u	6.7h-k	1.7n-q	0.0j
49Saturna	1.3xy	0.3tu	0.0j	1.3s-w	0.0q	0.0q	0.7hij
54King Edward	20.7d-i	21.0bc	4.7c-g	9.0g-k	14.0bcd	21.7bc	11.3abc
59Desiree	18.7e-j	14.3fgh	6.7cd	10.0e-i	9.3fgh	25.0b	9.3cde
64Pentland Dell	4.3s-y	3.3o-u	0.0j	2.0r-w	3.3l-q	2.3m-q	0.0j
69Saxon	1.3xy	0.3tu	0.0j	0.0w	0.3q	1.7n-q	0.0j
74Cabaret	21.3d-h	18.3cd	5.3cde	12.7de	14.0bcd	5.7j-q	3.3ghi
79Charlotte	31.7ab	18.3cd	2.7e-j	16.7bc	14.0bcd	1.7n-q	0.0j
84Fontane	11.7k-q	8.7jkl	4.7c-g	7.3i-n	7.7g-j	3.3l-q	1.7hij
89Rooster	13.3j-p	4.7m-r	0.0j	6.7i-o	5.3i-m	2.3m-q	0.0j
94Russet burbank	25.7cd	8.0j-m	0.0j	11.0e-h	8.0ghi	31.7a	0.0j
99Innovator	8.3p-v	5.3l-p	4.3c-h	8.3h-l	4.0k-o	0.0q	0.7hij
LSD (P=.05)	4.97	3.09	2.74	2.84	2.68	5.65	2.44
Standard Deviation	3.07	1.91	1.70	1.76	1.66	3.49	1.51
CV	42.72	37.52	96.49	57.49	44.61	53.62	94.9
Replicate F	5.571	0.085	0.767	0.488	3.551	3.288	2.530
Replicate Prob(F)	0.0046	0.9188	0.4662	0.6148	0.0310	0.0399	0.0828
Treatment F	24.427	39.877	12.154	22.746	32.706	13.441	14.120
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

Table 6.3.4 – Effect of rimsulfuron (12.5g ai/ha) + metribuzin (140g/ha) on the vigour reduction (as % groundcover versus untreated control), chlorosis (%) and necrosis (%) of a range of potato varieties – 7, 15 and 21 DAT1.

Crop Code	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU
Crop Scientific Name	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>
Crop Name	Potato	Potato	Potato	Potato	Potato	Potato	Potato
Crop Variety	Various	Various	Various	Various	Various	Various	Various
Rating Date	Jun-24-2013	Jul-2-2013	Jul-8-2013	Jun-24-2013	Jul-2-2013	Jun-24-2013	Jul-2-2013
Rating Type	VIGRED	VIGRED	VIGRED	PHYNEC	PHYNEC	PHYCHL	PHYCHL
Rating Unit	%RELB	%RELB	%RELB	%	%	%	%
Trt Treatment							
No. Name	1	2	3	4	5	6	7
5Maris piper	10.0m-s	7.0k-o	7.0c	0.0w	3.7k-p	23.3b	7.0ef
10Estima	6.3q-y	4.0n-t	1.7f-j	0.7uvw	4.0k-o	15.0c-g	0.0j
15Markies	0.0y	0.0u	0.0j	0.0w	0.0q	8.0g-o	0.0j
20Lady rosetta	2.0wxy	0.0u	0.0j	0.0w	0.0q	10.7f-k	0.0j
25Maris peer	2.3v-y	3.7o-u	0.0j	0.0w	1.7n-q	12.3f-j	1.7hij
30Hermes	5.0r-y	5.3l-p	0.7ij	1.7s-w	5.0i-m	11.0f-k	1.7hij
35Melody	4.3s-y	6.3k-o	1.7f-j	1.7s-w	2.3m-q	21.7bc	13.3ab
40Marfona	0.7y	0.0u	0.0j	0.0w	0.0q	7.3h-p	0.0j
45Harmony	3.0u-y	6.7k-o	0.0j	0.7uvw	5.3i-m	12.3f-j	3.7gh
50Saturna	0.0y	0.0u	0.0j	0.0w	0.0q	8.3g-n	0.0j
55King Edward	3.3u-y	1.0r-u	0.0j	0.0w	0.0q	11.0f-k	5.0fg
60Desiree	2.3v-y	1.0r-u	0.0j	0.0w	0.3q	13.3e-i	2.7g-j
65Pentland Dell	1.7xy	1.0r-u	0.7ij	0.3vw	0.7pq	10.0f-l	0.7hij
70Saxon	0.7y	0.0u	0.0j	0.0w	0.0q	15.0c-g	0.0j
75Cabaret	17.3f-k	18.0cde	7.3c	7.7i-m	16.3bc	14.3d-h	0.0j
80Charlotte	0.0y	0.3tu	0.0j	0.0w	0.3q	10.7f-k	0.0j
85Fontane	0.3y	0.0u	0.0j	0.0w	0.0q	10.0f-l	0.7hij
90Rooster	0.0y	0.0u	0.0j	0.0w	0.0q	5.7j-q	0.0j
95Russet burbank	2.7v-y	0.0u	0.0j	0.0w	0.0q	15.0c-g	0.0j
100Innovator	18.3e-j	15.0d-g	12.3b	12.3def	13.3cde	11.0f-k	0.0j
LSD (P=.05)	4.97	3.09	2.74	2.84	2.68	5.65	2.44
Standard Deviation	3.07	1.91	1.70	1.76	1.66	3.49	1.51
CV	42.72	37.52	96.49	57.49	44.61	53.62	94.9
Replicate F	5.571	0.085	0.767	0.488	3.551	3.288	2.530
Replicate Prob(F)	0.0046	0.9188	0.4662	0.6148	0.0310	0.0399	0.0828
Treatment F	24.427	39.877	12.154	22.746	32.706	13.441	14.120
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

6.4 Thorpe Constantine 2013 – all results

Table 6.4.1 – Effect of metribuzin (350g ai/ha) on the vigour reduction (as % groundcover reduction versus untreated control), chlorosis (%) and necrosis (%) of a range of potato varieties – 8, 14 and 21 DAT1.

Crop Code	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU
Crop Scientific Name	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>
Crop Name	Potato	Potato	Potato	Potato	Potato	Potato	Potato
Part Rated	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -
Rating Date	Jun-24-2013	Jun-30-2013	Jul-7-2013	Jun-24-2013	Jun-30-2013	Jun-24-2013	Jun-30-2013
Rating Type	VIGRED	VIGRED	VIGRED	PHYNEC	PHYNEC	PHYCHL	PHYCHL
Rating Unit	%RELB	%RELB	%RELB	%	%	%	%
Trt Treatment							
No. Name	1	2	3	4	5	6	7
2 Maris piper	15.0ef	7.3hij	13.3b	1.7ijk	0.0k	5.0d-j	9.0cd
7 Estima	20.0e	16.0cde	9.0cd	10.3e	13.3bcd	0.0k	0.0g
12 Markies	3.3i-q	2.3m-s	0.0m	2.7h-k	1.7ijk	0.0k	0.0g
17 Lady rosetta	3.3i-q	2.3m-s	2.3i-m	0.0k	0.0k	0.0k	0.0g
22 Maris peer	11.7fgh	7.7hi	2.3i-m	4.3f-i	5.7fgh	5.3d-i	1.7efg
27 Hermes	6.0h-q	4.3i-q	0.0m	4.0f-i	1.3jk	1.3h-k	3.3ef
32 Melody	19.0e	16.7cde	6.0efg	15.7bc	10.0e	4.3e-k	9.0cd
37 Marfona	4.0i-q	4.3i-q	5.7e-h	0.0k	0.0k	1.3h-k	1.7efg
42 Harmony	15.0ef	18.3bcd	4.3f-j	13.3cd	13.3bcd	0.0k	0.0g
47 Saturna	0.7pq	0.0s	0.0m	0.0k	0.0k	0.0k	1.0fg
52 King Edward	3.7i-q	0.3rs	0.7klm	0.0k	0.0k	3.0f-k	2.0efg
57 Desiree	2.7k-q	2.3m-s	0.0m	0.7jk	0.0k	0.0k	4.0e
62 Pentland Dell	6.7g-p	3.3k-s	0.7klm	0.0k	0.0k	0.0k	1.7efg
67 Saxon	1.7m-q	3.0l-s	3.3g-m	0.0k	0.0k	0.0k	0.0g
72 Cabaret	18.3e	16.7cde	4.0f-k	11.0de	17.0a	1.7h-k	0.0g
77 Charlotte	1.7m-q	3.7j-s	1.7j-m	0.0k	0.7k	0.0k	1.0fg
82 Fontane	2.7k-q	0.0s	0.0m	0.0k	0.0k	0.0k	0.0g
87 Rooster	5.7i-q	0.7qrs	0.0m	0.0k	0.0k	1.7h-k	0.7g
92 Russet burbank	9.0g-j	7.0h-k	1.3j-m	3.7f-j	4.0g-j	0.0k	0.0g
97 Innovator	45.0a	28.3a	20.7a	17.7b	17.3a	0.0k	1.0fg
LSD (P=.05)	4.84	3.00	2.63	2.62	2.38	3.71	2.04
Standard Deviation	3.00	1.86	1.63	1.62	1.47	2.29	1.26
CV	52.26	44.4	96.29	75.98	63.89	106.97	94.6
Replicate F	1.409	0.491	8.975	0.218	3.256	3.451	4.434
Replicate Prob(F)	0.2475	0.6132	0.0002	0.8042	0.0411	0.0341	0.0134
Treatment F	27.048	37.498	11.542	21.885	29.533	8.900	20.132
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

Table 6.4.2 – Effect of metribuzin (140g ai/ha) on the vigour reduction (as % groundcover reduction versus untreated control), chlorosis (%) and necrosis (%) of a range of potato varieties – 8, 14 and 21 DAT1.

Crop Code	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU
Crop Scientific Name	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>
Crop Name	Potato	Potato	Potato	Potato	Potato	Potato	Potato
Part Rated	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -
Rating Date	Jun-24-2013	Jun-30-2013	Jul-7-2013	Jun-24-2013	Jun-30-2013	Jun-24-2013	Jun-30-2013
Rating Type	VIGRED	VIGRED	VIGRED	PHYNEC	PHYNEC	PHYCHL	PHYCHL
Rating Unit	%RELB	%RELB	%RELB	%	%	%	%
Trt Treatment							
No. Name	1	2	3	4	5	6	7
3Maris piper	9.3ghi	5.0i-o	5.7e-h	0.0k	0.0k	6.7d-g	10.3bc
8Estima	6.7g-p	4.0j-r	2.3i-m	0.7jk	2.7ijk	1.7h-k	0.0g
13Markies	1.3n-q	1.0p-s	0.0m	1.3ijk	0.7k	0.0k	0.0g
18Lady rosetta	0.7pq	1.0p-s	0.0m	0.0k	0.0k	0.0k	0.0g
23Maris peer	2.3k-q	0.7qrs	0.0m	0.0k	0.0k	0.0k	0.0g
28Hermes	4.0i-q	0.7qrs	0.0m	1.7ijk	0.3k	1.7h-k	0.0g
33Melody	8.0g-l	7.3hij	2.7h-m	4.0f-i	3.0h-k	2.3g-k	10.3bc
38Marfona	1.7m-q	2.3m-s	2.0j-m	0.0k	0.7k	0.0k	0.0g
43Harmony	8.0g-l	11.7fg	1.3j-m	5.3fgh	7.3f	0.0k	0.7g
48Saturna	0.0q	0.0s	0.3lm	0.0k	0.0k	0.0k	0.0g
53King Edward	1.0opq	0.0s	0.3lm	0.0k	0.0k	0.0k	0.0g
58Desiree	0.0q	0.0s	0.0m	0.0k	0.0k	0.0k	0.0g
63Pentland Dell	2.7k-q	0.3rs	0.0m	0.0k	0.0k	0.0k	0.0g
68Saxon	0.0q	0.0s	0.7klm	0.0k	0.0k	0.0k	0.0g
73Cabaret	12.3fg	19.3bc	3.7f-l	6.3f	16.7a	1.7h-k	0.0g
78Charlotte	0.0q	1.0p-s	0.7klm	0.0k	0.0k	0.0k	0.0g
83Fontane	0.7pq	0.0s	0.0m	0.0k	0.0k	0.0k	0.0g
88Rooster	0.0q	0.0s	0.0m	0.0k	0.0k	0.0k	0.0g
93Russet burbank	2.0l-q	0.0s	0.0m	0.0k	0.0k	0.0k	0.0g
98Innovator	16.7ef	16.7cde	11.3bc	10.7de	13.3bcd	0.0k	1.0fg
LSD (P=.05)	4.84	3.00	2.63	2.62	2.38	3.71	2.04
Standard Deviation	3.00	1.86	1.63	1.62	1.47	2.29	1.26
CV	52.26	44.4	96.29	75.98	63.89	106.97	94.6
Replicate F	1.409	0.491	8.975	0.218	3.256	3.451	4.434
Replicate Prob(F)	0.2475	0.6132	0.0002	0.8042	0.0411	0.0341	0.0134
Treatment F	27.048	37.498	11.542	21.885	29.533	8.900	20.132
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

Table 6.4.3 – Effect of bentazone (1440g ai/ha) + Cropspray 11E (2.0l/ha) on the vigour reduction (as % groundcover reduction versus untreated control), chlorosis (%) and necrosis (%) of a range of potato varieties – 8, 14 and 21 DAT1.

Crop Code	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU
Crop Scientific Name	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>
Crop Name	Potato	Potato	Potato	Potato	Potato	Potato	Potato
Part Rated	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -
Rating Date	Jun-24-2013	Jun-30-2013	Jul-7-2013	Jun-24-2013	Jun-30-2013	Jun-24-2013	Jun-30-2013
Rating Type	VIGRED	VIGRED	VIGRED	PHYNEC	PHYNEC	PHYCHL	PHYCHL
Rating Unit	%RELB	%RELB	%RELB	%	%	%	%
Trt Treatment							
No. Name	1	2	3	4	5	6	7
4Maris piper	7.7g-m	5.7h-m	3.0g-m	0.0k	0.0k	0.7jk	0.0g
9Estima	4.3i-q	5.0i-o	0.0m	2.7h-k	2.0ijk	0.0k	0.0g
14Markies	40.0b	25.7a	6.7def	21.7a	15.0ab	6.7d-g	2.3efg
19Lady rosetta	25.0d	17.7bcd	5.3e-i	6.0fg	10.7de	11.7bc	1.0fg
24Maris peer	5.0i-q	2.0m-s	0.7klm	1.3ijk	1.3jk	3.0f-k	0.0g
29Hermes	1.7m-q	0.0s	0.0m	0.0k	0.0k	0.0k	0.0g
34Melody	7.0g-o	5.0i-o	0.0m	1.7ijk	0.0k	8.7cde	8.3cd
39Marfona	4.7i-q	3.0l-s	1.0klm	0.0k	0.0k	4.3e-k	3.7e
44Harmony	1.0opq	1.3o-s	0.0m	0.0k	0.7k	0.3k	0.0g
49Saturna	0.0q	0.7qrs	1.0klm	0.0k	0.0k	0.0k	0.0g
54King Edward	33.3c	15.3de	3.7f-l	15.0bc	6.0fg	15.0b	15.7a
59Desiree	33.3c	20.7b	6.7def	9.3e	10.0e	20.0a	16.0a
64Pentland Dell	4.3i-q	1.7n-s	0.0m	0.0k	0.0k	0.0k	0.0g
69Saxon	0.0q	1.0p-s	0.0m	0.0k	0.0k	0.0k	0.0g
74Cabaret	6.0h-q	6.3h-l	0.0m	0.7jk	3.7g-j	0.0k	0.0g
79Charlotte	5.3i-q	5.3i-n	0.7klm	4.3f-i	4.3ghi	0.0k	0.0g
84Fontane	8.3g-k	3.3k-s	5.3e-i	2.3h-k	1.7ijk	3.0f-k	1.7efg
89Rooster	4.0i-q	2.7l-s	0.7klm	0.0k	0.0k	2.7f-k	1.0fg
94Russet burbank	33.3c	19.3bc	1.7j-m	11.0de	11.7cde	20.0a	0.0g
99Innovator	4.3i-q	2.7l-s	3.0g-m	0.0k	0.0k	4.3e-k	0.0g
LSD (P=.05)	4.84	3.00	2.63	2.62	2.38	3.71	2.04
Standard Deviation	3.00	1.86	1.63	1.62	1.47	2.29	1.26
CV	52.26	44.4	96.29	75.98	63.89	106.97	94.6
Replicate F	1.409	0.491	8.975	0.218	3.256	3.451	4.434
Replicate Prob(F)	0.2475	0.6132	0.0002	0.8042	0.0411	0.0341	0.0134
Treatment F	27.048	37.498	11.542	21.885	29.533	8.900	20.132
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

Table 6.4.4 – Effect of rimsulfuron (12.5g ai/ha) + metribuzin (140g/ha) on the vigour reduction (as % groundcover versus untreated control), chlorosis (%) and necrosis (%) of a range of potato varieties – 8, 14 and 21 DAT1.

Crop Code	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU
Crop Scientific Name	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>	Solanum tubero>
Crop Name	Potato	Potato	Potato	Potato	Potato	Potato	Potato
Part Rated	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -	LEAF -
Rating Date	Jun-24-2013	Jun-30-2013	Jul-7-2013	Jun-24-2013	Jun-30-2013	Jun-24-2013	Jun-30-2013
Rating Type	VIGRED	VIGRED	VIGRED	PHYNEC	PHYNEC	PHYCHL	PHYCHL
Rating Unit	%RELB	%RELB	%RELB	%	%	%	%
Trt Treatment							
No. Name	1	2	3	4	5	6	7
5Maris piper	6.7g-p	4.7i-p	4.3f-j	0.0k	0.0k	9.0cd	7.3d
10Estima	3.7i-q	3.7j-s	1.3j-m	0.0k	2.7ijk	1.7h-k	0.0g
15Markies	0.0q	0.0s	0.0m	0.0k	0.0k	0.0k	0.0g
20Lady rosetta	1.0opq	0.0s	0.0m	0.0k	0.0k	0.0k	0.0g
25Maris peer	4.7i-q	2.3m-s	0.7klm	0.0k	0.7k	5.7d-h	0.7g
30Hermes	3.7i-q	0.0s	0.0m	0.0k	0.0k	7.7cde	0.0g
35Melody	7.3g-n	5.0i-o	1.0klm	3.0g-k	0.0k	9.3cd	12.3b
40Marfona	0.0q	0.0s	0.7klm	0.0k	0.0k	0.0k	0.0g
45Harmony	9.0g-j	9.0gh	1.3j-m	5.0fgh	5.7fgh	5.7d-h	1.7efg
50Saturna	0.0q	0.0s	0.0m	0.0k	0.0k	1.7h-k	0.0g
55King Edward	0.0q	0.0s	0.0m	0.0k	0.0k	1.7h-k	0.0g
60Desiree	1.3n-q	0.0s	0.3lm	0.0k	0.0k	4.3e-k	0.0g
65Pentland Dell	1.3n-q	0.0s	0.0m	0.0k	0.0k	2.3g-k	0.0g
70Saxon	0.0q	0.0s	0.7klm	0.0k	0.0k	0.0k	0.0g
75Cabaret	9.3ghi	19.3bc	3.3g-m	4.3f-i	14.0bc	9.3cd	3.3ef
80Charlotte	3.0j-q	0.0s	0.7klm	0.0k	0.0k	5.0d-j	0.0g
85Fontane	0.0q	0.0s	1.0klm	0.0k	0.0k	0.0k	0.0g
90Rooster	0.0q	0.0s	0.0m	0.0k	0.0k	1.0ijk	0.0g
95Russet burbank	3.0j-q	0.0s	0.0m	0.0k	0.0k	5.0d-j	0.0g
100Innovator	18.3e	14.0ef	8.0de	10.0e	11.0de	7.0def	0.0g
LSD (P=.05)	4.84	3.00	2.63	2.62	2.38	3.71	2.04
Standard Deviation	3.00	1.86	1.63	1.62	1.47	2.29	1.26
CV	52.26	44.4	96.29	75.98	63.89	106.97	94.6
Replicate F	1.409	0.491	8.975	0.218	3.256	3.451	4.434
Replicate Prob(F)	0.2475	0.6132	0.0002	0.8042	0.0411	0.0341	0.0134
Treatment F	27.048	37.498	11.542	21.885	29.533	8.900	20.132
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)