Horticulture Innovation Australia

Final Report

New potato cultivars Evaluation for McCain Foods

David Ryan
McCain Foods (Aust) Pty Ltd

Project Number: PT05018

PT05018

This project has been funded by Horticulture Innovation Australia Limited with co-investment from McCain Foods (Aust) Pty Ltd and funds from the Australian Government.

This report was previously confidential.

The confidentiality period has now expired. Please ignore all references to confidentiality within the report.

ISBN 0 7341 3679 X

Published and distributed by:
Horticulture Innovation Australia Limited
Level 8, 1 Chifley Square
Sydney NSW 2000
Tel: (02) 8295 2300
Fax: (02) 8295 2399

Final Report for

Horticulture Australia Limited

Project Number: **PT05018**
(Completion date 30/8/06)

New Potato Cultivar Evaluation for McCain Foods (Aust) Pty Ltd Safries Pty Ltd

David Ryan

Research Provider:
McCain Foods (Aust) Pty Ltd &
Safries Pty Ltd

August 2006

Final Report HAL Project

Project No : **PT05018 continuation of PT04020**
Project Leader : David Ryan
McCain Foods (Aust) Pty Ltd.
P.O Box 105 Wendouree 3355

Project Team: Roger Kirkham
Private Consultant.
292 Cummins Lane Yea, Victoria 3717

Leon Hingston
Tasmanian Institute of Agricultural Research
PO Box 303, Devonport, Tas., 7310

Ben Dowling
Dowling AgriTech.
P.O Box 8093 Mt Gambier SA 5291

Purpose of Report: This report provides the final report on this project in which new French fry potato cultivars have been evaluated in 4 regional trials and one seed multiplication plot during 2005-2006.

Acknowledgement: The author wishes to acknowledge the following support:-

1. Horticulture Australia Limited for the financial support provided from matched potato industry levy funds.
2. McCain Foods Grower groups in Victoria, New South Wales and Tasmania as well as the Safries Grower group in South Australia for their financial support in supplying voluntary contributions.
3. The numerous potato growers and research facilities that have contributed to the work, in time and resources over the past twelve months.

Date: August 2006

Table of Contents **Page**

List of Tables

Media Summary

The evaluation and identification of new French fry cultivars with improved processing and agronomic characteristics adapted to different production regions of Australia is essential for the French fry Potato Industry to remain competitive, profitable and sustainable.

New Varieties need to have yield and French fry processing parameters equal to or greater than existing processing varieties. Cultivar selection requires the variety to have improved specific French fry quality parameters and show stable high yields. Varieties need to be efficient or require reduced inputs such as chemical and fertilisers to have minimum impact on the environment and reduce the costs of production.

McCain Foods (Aust) Pty Ltd and Safries Pty Ltd in partnership with the McCain growers groups in Victoria, New South Wales and Tasmania and the Safries grower group in South Australia along with matching funds from HAL have tested potential new potato lines for the French fry industry over the past twelve months. Trials were conducted in Berrigan (N.S.W), Ballarat (Victoria), Forthside (Tasmania) and Penola (South Australia).

This project has evaluated and identified potential new varieties for the French fry Industry. Under previous evaluation projects some varieties were selected as potential replacements and these continue to be evaluated.

Further evaluation of breeding lines across production environments is needed to determine their potential for commercialisation. It is planned that this project is continued next season to carry out further evaluation of some highly potential varieties.

Due to unforeseen climatic conditions the Berrigan trial was abandoned in December. Shortly after planting a extreme thunderstorm saturated the trial site causing wide spread seed piece breakdown. With less then 5% of the trial emerging it was decided to not continue with any further assessments.

Technical Summary

Potato genotypes introduced from the Potato Breeding program at Toolangi were evaluated in field experiments in 4 major potato growing regions of South Eastern Australia. In the 4 trial sites new cultivars were grown in randomised block experiments, with 3 replicates per entry, 3 trials were located within commercial crops and compared against current French fry commercial cultivars and the Tasmanian trial was located on the Forthside research facility. All cultivars that are included in the program are maintained at the Toolangi research farm as seed for future variety work. Also as part of the project there was a seed multiplication observational plot at Forthside.

The project identified new varieties with potential French fry processing capabilities. Promising newly bred lines were identified at each trial site and further evaluation will be required before possible commercial release. Cultivars will be tested over a number of seasons to determine if they are consistent in results. The cultivars that will be evaluated further include Daisy, 98-109-1, 00-33-17, 01-31-1 and 02-92-14 (Ballarat) 00-33-15, 00-33-17, and 02-76-8 (Tas) 00-33-17 and 01-3-3 (S.A).

The promising new varieties in this project are not yet in commercial production so it is not possible to accurately estimate the improved financial gain, estimate market share, costs of growing new lines, reduced chemical inputs and financial gains at present. However, the high potential yields and reduced input costs of new varieties will result in future substantial financial gains.

Introduction

New Potato varieties with improved French fry characteristics are required to help maintain and increase the competitive position of French fry potato growers and to improve the processing recovery rates of French fry processing plants. Such improved varieties must meet the demands of the processing potato grower and the processor at the same time, with high yield, reduced cost of growing and excellent processing attributes.

Existing varieties are not ideally suited to all Australian production areas and systems. Common problems with current French fry processing varieties include: susceptibility to physiological disorders such as misshapen tubers, second growth and hollow heart (mainly Russet Burbank), susceptibility to disease's such as Target Spot, Common Scab, Powdery Scab, Pink Rot, Rhizoctonia and Late Blight and susceptibility to Virus's such as Potato Leaf Roll and Tomato Spotted Wilt Virus (mainly Shepody and Riverina Russets). Other problems include geographical constraints with environmental conditions limiting varietal options available to growers and processors.

In partnership with grower groups from each major potato growing area, McCain Foods (Aust) Pty Ltd has undertaken this variety development program with high importance. As a research priority McCain Foods has given variety breeding, selection and development it's highest level of commitment and we believe that the potential for a positive result is very likely.

Methods

Experimental design

Crossbred lines and new or check varieties used in this project have been either bred in Australia or introduced under private arrangements by McCain Foods (Aust) Pty Ltd or commercial partners. The Department of Primary Industries, Toolangi, Victoria carried out the breeding. Each of these new lines were grown from botanical seed in a glasshouse and after 3 field generations, during which time selection begins and seed is multiplied, clones are then selected to be entered into district variety trails. All trials were planted with seed produced, harvested and stored under the same conditions to obtain seed of the same physiological age for valid comparisons.

Field experiments were conducted using a randomised block design replicated in each of the 3 blocks. 3 of the 4 experiments were grown within commercial crops with the Tasmanian replicated trial and seed multiplication plot being grown at the Forthside research facility. Within each experiment the common commercial variety for the particular time of delivery and district was used as standard controls. Individual plots were either 4 or 5 metres long (depending upon trial site) with 2 rows per plot. Coloured maker plants (Ruby Lou) were planted at the beginning and end of each plot in a one-metre strip to prevent mixing of varieties at planting and harvest. During the growing season, plots were assessed for emergence, vigour, maturity and pest and disease susceptibility. At harvest plots were assessed for tuber characteristics including colour, texture, shape, distortion, eye characteristics, size and evenness. Each plot was yield graded by size's specific to processing parameters for French fry processing.

Samples from each plot were removed after grading, with one sample from each plot assessed at McCain Foods (Aust) Pty Ltd testing facilities for Dry Matter content and cooking ability. Also removed from each plot (Riverina trial and Tasmanian seed multiplication plot not included) was a storage sample which is held in commercial storage facilities by McCain and at 3 staggered intervals during the next 7 months one replicate of samples will be removed and tested for processing attributes again.

Field experiments were conducted at Dunnstown near Ballarat – Victoria (32 entries), Savernake near Berrigan – N.S.W (24 Entries), Mingbool near Penola – S.A. (12 entries) and Forthside Research Farm – Tasmania (26 entries). The Victorian trial was planted in mid November and harvested in early May, the Tasmanian trial was planted in late October and lifted in late April, the South Australian trial was planted in October and harvested in early April whilst the N.S.W trial was planted in October and as explained above was not harvested. Ballarat and Forthside soil types are similar Krasnozem types and both Mingbool and Savernake are sandy type soils.

Data was analysed by standard analyses of variance procedures. Least significant differences (LSD) among treatment means were expressed at the probability of 5%. This means that the calculated LSD between treatment means is 95% due to the treatment per se (in this case the genotype) and only 5% due to chance or random effects such as irrigation or soil variations between plots (Williams 2004).

Results and Discussion

Complete results from harvest and processing assessments for the three experiments are included in Appendix 1 along with written assessment of the Tasmanian seed multiplication plot.

Table M1 below gives a comparison of selected French fry cultivars from the 3 field trials during the 2005-2006 growing season. Fry grade yield is expressed as tonnes per hectare and fry colour as a percentage.

Table M1.

	Fry grade yield (t/ha) (fry colour in parentheses)		
Entry	Vicϕ	S.A+	Tas+
Daisy	80.9 (99)	43.7 (64)	
Russet Burbank	68.6 (100)	58.5 (100)	32.2(100)
Shepody			23.2 (80)
98-109-1	70.2 (97)	38.2 (99)	
00-33-15			38.1 (97)
00-33-17	59.2 (97)	53.5 (100)	36.1 (64)
01-3-3		63.7 (93)	
01-31-1	63.7 (99)	49.7 (100)	
02-76-8	74.9 (100)		
02-92-14	80.0 (100)		
LSD* P=0.05	12.3 (1.3)		ns

Fry colour was assessed by the USDA chip colour chart. The zero category % fry colour is shown in brackets.

ϕ Fry grade yield is > 75grams

\+ Fry grade yield is > 100grams

* LSD = Least significant difference.

Daisy

Daisy has been imported to Australia by a private firm. It has performed well again in Ballarat with yield results as seen above (Table M1) being the highest ranked above 75-gram variety in the Ballarat trial for the second year in a row. Daisy has typically emerged very quick but it does has a very late maturity. We did recover samples of Daisy from the Riverina trial and found it to have low dry matter and very poor tuber shape. I would not discount Daisy from this district however as the trial was not representative of a commercial situation. Yield and cooking quality was below average in the South Australian trial. We aim at putting a small bulk plot in all districts as soon as the seed is available. This cultivar will continue to be assessed in our Ballarat and Tasmanian replicated trial.

Russet Burbank

Russet Burbank is the main French fry processing variety that is grown in Australia, therefore it was used as a check variety in the Victorian, South Australian and Tasmanian

trials and the Tasmanian seed multiplication plots. Russet Burbank is not suited to the early districts of the Riverina. Russet Burbank is a long maturing variety that requires significant inputs during the season. It requires certain environmental conditions to be in its favour to reduce the pest and disease incidence. Russet Burbank has the ability to be stored for an extended period of time and still retain its processing attributes.

Shepody

Shepody is the main early to mid variety used for French fry production in Australia. It has a medium length maturity, which enables it to be used for December, January, and February processing. Shepody is not stored by McCain Foods (Aust). Shepody sets only average tubers per plant and can produce larger size tubers, which are undesirable for processing.

98-109-1

98-109-1 was possibly the best looking cultivar in the Ballarat trial last season, however it had a very poor result in the Penola trial. It had good size and shape in Ballarat with good tuber numbers, which is the reverse to the South Australian trial. In past trials we have seen the odd tendency to grow a slightly pair shaped tuber which may be due to stress. 98-109-1 typically sets a high number of tubers and produces a high percentage of tubers in the 75 – 340 gram range. We do need to watch this cultivars susceptibility to TSWV. This cultivar will be considered to be included into tissue culture by the McCain variety committee and then included into bulk commercial plantings over the next few seasons.

00-33-15

00-33-15 had the highest fry grade yield in the Tasmanian trial last season however it was a very low yielding trial. It showed good uniform shape and no signs of hollow, which was present in the majority of cultivars. We will continue with a small bulk plot on the Forthside research farm next season.

00-33-17

00-33-17 has shown us that it has potential to be a very good variety but it has had some mixed results this past season. It was disappointing in the Ballarat trial with servere rots effecting yield, however tuber shape was still excellent. In Tasmania it did have a touch of scab and the maturity was late. The fry colour in Tassie is of concern (Table M1) but some management issues may have contributed to the cooking quality being affected. With this in mind however we have seen some minor colour in samples of 00-33-17 before. The results from the South Australian trial is encouraging with above average yield results. Tuber numbers were low but this was a trend throughout the entire trial.

We have backed this variety and put it into tissue culture with a large volume of minitubers on order to be planted in season 06-07. We also have some generation 1 seed coming through the system so we will have some commercial trials in the coming couple of seasons.

01-3-3

01-3-3 had not been trialled in any lighter soil types and was included in the South Australian trial in hope to increase length width ratio. Yields in past trials were very good at Ballarat but tended to have a rounder shape tuber than required. Initial results from Penola suggest that the lighter soil types might suit this cultivar with high yields and good tuber characteristics being achieved. Maturity is very late which may suit a February type delivery from the Riverina. Next season we will continue with this variety in the lighter sands of the Riverina and Penola.

01-31-1

01-31-1 has shown a lot of potential in past seasons and as such we have included it into tissue culture in the past 12 months. Ballarat trial results were not standout but the basic good attributes that we have seen in the past were still present. There was a touch of rot in the Ballarat trial plot, which we need to be mindful of. Tasmanian seed multiplication showed similar characteristics as to Ballarat results over previous years. 01-31-1 has at times produced a paired shape tuber and this was observed in the plots there. Results from the South Australian trial suggests that it was slightly round at times, which is surprising in the lighter soil type. We will continue with this cultivar at all sites for the time being and maybe wait 12 months before we order minitubers.

02-76-8

02-76-8 was included in the Ballarat trial as a possible wedge type replacement. It is a very late maturing line, which had a slightly uneven tuber size and shape. Tuber skin texture was very tough on one replication. We will not continue with this cultivar in Ballarat but it will be included in the stage 2 trials in Tasmania.

02-92-14

02-92-14 plants collapsed during the season but this did not affect the yield results (Table M1). It has a late maturity and showed some slight distortion in the tubers. Tasmanian comments included that it is too thin, but length width in Ballarat trial of 1.62 seems not to bad. We will continue with this cultivar at all sites for at least one more season.

Technology Transfer

A Field day was conducted during the harvest of the Victorian trial with members of the McCain Grower Group invited to attend, along with Department of Primary Industries (Vic) representatives and production personnel from McCain Food processing plant in Ballarat. Attendance and interest in the trial was satisfactory considering the trial was harvested in one of the busiest times for the growers. Ballarat's local growers were also welcome to inspect the trial site during the season.

In addition to the field day in Ballarat, local growers representatives and research personnel were invited to the other 3 trial harvest days. Confidential results from all trial sites will be presented to each grower group and also to the McCain Foods Variety evaluation committee. A public version of the results is available by contacting HAL.

Recommendations

Further evaluation and development of new French fry varieties is required prior to the commercialisation of any cultivar. The past three seasons have shown, that with the industry groups taking a far greater ownership in variety evaluation and commercialisation of new cultivars, interest in the four variety trials conducted under this project has been very high. Industry groups are anticipating return on their investment into research and development and a superior variety to current varieties will achieve this. Over the past two seasons we have included 3 varieties into tissue culture that have shown potential. These cultivars will be bulked up over the next few seasons during which we need to further develop agronomy programs for each specific cultivar. Currently this work is funded privately.

This project will continue next season (VC Project funding pending) in a similar capacity as season 2005-2006. Small plot trials give industry personnel a scientific result, with definitive answers arrived upon, making the selection process a constant variable from year to year. The size of the project over four states is also allowing for variability in cultivar performance due to environmental conditions to be evaluated, this is very important when the French fry processor is sourcing it's raw product from many different districts with different climatic constraints.

References

Williams, C. (2004) Evaluation and development of new potato genotypes in South Australia. Final Report HAL Project No. PT 02009.

Appendix 1.

Victorian variety evaluation trial 2005-2006. Ballarat (Dunnstown) is the main delivery and storage district for McCain Foods Ballarat processing plant. Planted 17th November, the trial was lifted on the 16th of May 2006.

Table 1.
Ballarat trial comparison of potato lines for different tuber yield weight grades, tubers per plant and processing parameters.

	Spacing	Yield, Tonnes per Hectare					Rank	Tuber	Quality					
	in Rows	Chats	Small	Large	Over Size	Fry Grade	by Fry	No. Per	Dry	Fry Colour *				
Entry	cm	0-75g	75-170g	170-340g	>340g	>75g	Grade	Plant	Matter %	0	1	2	3	4 Ends
Daisy	31.2	0.8	14.9	55.1	10.9	80.9	1	9.9	22.2	99			1	
Russet Burbank	38.4	1.5	11.9	38.5	18.2	68.6	9	11.9	22.4	100				
98 - 96 - 15	41.0	2.3	12.1	39.4	14.1	65.6	13	12.1	21.9	99	1			
98 - 96 - 31	28.0	0.8	8.9	37.9	29.1	75.9	3	6.8	23.0	97	3			
98 - 109 - 1	38.4	1.9	17.7	41.3	11.2	70.2	8	12.2	22.8	97	2	1		
00 - 23 - 1	28.0	1.1	7.7	35.1	24.9	67.7	11	6.2	20.5	95	5			1
00 - 33 - 17	31.2	1.9	8.4	36.1	14.7	59.2	23	7.7	22.7	97	3			
01 - 31 - 1	31.2	2.2	12.1	37.9	13.7	63.7	18	8.1	24.5	99	1			
01 - 46 - 27	28.0	1.1	6.4	40.3	18.2	64.9	16	6.2	22.8	99	1			
01 - 46 - 53	31.2	1.9	12.7	38.7	13.7	65.1	15	8.3	22.6	97	2	1		3
01 - 49 - 29	31.2	0.7	6.7	37.5	21.1	65.3	14	6.9	21.4	100				
02 - 3 - 15	35.7	1.2	7.9	37.5	14.7	60.1	22	8.4	22.2	99	1			
02 - 30 - 9	31.2	3.2	20.4	44.5	1.4	66.3	12	10.8	23.8	100				
02 - 30 - 26	31.2	1.6	12.3	42.7	9.5	64.5	17	8.1	23.4	99		1		
02 - 32 - 5	33.4	1.2	9.5	43.2	17.5	70.2	8	8.4	22.9	100				
02 - 36 - 9	28.0	0.9	9.6	38.6	22.8	71.0	6	6.8	21.7	96	3		1	
02 - 39 - 2	31.2	2.6	18.9	32.7	3.6	55.2	25	9.1	22.4	100				
02 - 58 - 7	28.0	1.2	6.5	26.6	13.1	46.2	29	5.4	21.9	95		5		3
02 - 69 - 29	33.4	3.0	15.9	38.5	8.6	63.0	20	10.0	22.2	100				
02 - 71 - 14	31.2	3.3	19.4	32.7	2.1	54.2	27	9.7	21.7	100				
02 - 71 - 27	31.2	1.9	12.6	38.0	12.6	63.2	19	8.8	22.8	100				
02 - 71 - 37	31.2	1.8	14.9	40.8	12.4	68.1	10	9.1	20.3	100				
02 - 73 - 6	31.2	3.9	17.7	42.2	14.1	74.0	5	11.1	22.0	99	1			
02 - 74 - 3	28.0	0.9	5.6	29.5	20.0	55.1	26	5.5	22.0	100				
02 - 74 - 5	28.0	1.2	10.2	43.4	17.0	70.6	7	7.3	21.8	100				
02 - 76 - 8	31.2	1.8	16.3	43.5	15.1	74.9	4	9.5	20.8	100				
02 - 80 - 11	31.2	4.4	25.3	24.0	0.1	49.4	28	10.7	21.0	100				
02 - 83 - 4	31.2	4.2	5.7	21.4	4.4	31.5	31	4.0	23.4	100				
02 - 83 - 5	28.0	0.4	5.3	31.7	25.7	62.7	21	5.3	19.4	97		2	1	5
02 - 83 - 16	31.2	3.3	12.0	25.9	5.0	42.9	30	7.9	22.8	100				
02 - 91 - 3	33.4	2.5	9.9	31.6	15.5	57.0	24	8.8	21.3	97	3			1
02 - 92 - 14	33.4	1.4	17.0	47.8	15.2	80.0	2	10.5	24.7	100				
LSD [P=0.05]		1.2	5.4	8.9	9.5	12.3			1.7	1.3				
LSD [P=0.01]		1.5	7.1	11.6	12.6	15.9			2.2	1.7				

* Fry Colour at harvest (USDA colour chart)

Table 2
Ballarat trial comparison of potato lines for different tuber length width ratio's

Entry	Length Width Ratio
Daisy	1.3
Russet Burbank	1.73
98 - 96 - 15	1.94
98 - 96 - 31	1.66
98 - 109 - 1	1.48
00 - 23 - 1	1.6
00 - 33 - 17	1.83
01 - 31 - 1	1.37
01 - 46 - 27	1.49
01 - 46 - 53	1.52
01 - 49 - 29	1.28
02 - 3 - 15	1.53
02 - 30 - 9	1.17
02 - 30 - 26	1.49
02 - 32 - 5	1.51
02 - 36 - 9	1.71
02 - 39 - 2	1.33
02 - 58 - 7	1.42
02 - 69 - 29	1.8
02 - 71 - 14	1.49
02 - 71 - 27	1.54
02 - 71 - 37	1.42
02 - 73 - 6	1.52
02 - 74 - 3	1.58
02 - 74 - 5	1.71
02 - 76 - 8	1.22
02 - 80 - 11	1.46
02 - 83 - 4	1.43
02 - 83 - 5	1.37
02 - 83 - 16	1.28
02 - 91 - 3	1.64
02 - 92 - 14	1.57

South Australian variety evaluation trial 2005-2006.

Penola district (South East S.A.) is the main delivery and storage district for Safries processing plant in Penola, as well as a source of February and March deliveries to McCain Foods Ballarat processing plant. Planted in late October, the trial was lifted during May 2006.

Table 3.
Mingbool trial comparison of potato lines for different tuber yield weight grades, tubers per plant and processing parameters.

	Spacing	Yield, Tonnes per Hectare					Rank	Tuber	Quality						
	in	Chats	Small	Large	Over	Fry	by	No.							
	Rows				Size	Grade	Fry	Per	Dry	Fry Colour *					
Entry	cm	0-100g	100-170g	170-340g	>340g	>100g	Grade	Plant	Matter %	0	1	2	3	4	Ends	Tips
Daisy	31.2	13.5	17.1	13.10	0	43.7	12	4.9	20.2	64	31	3			2	
Russet Burbank	33.4	7.1	24.5	26.9	0.2	58.5	2	4.4	20.0	100						
98 - 96 - 31	31.2	3.9	11.4	24.6	1.6	39.9	9	2.9	19.9	99					1	
98 - 109 - 1	33.4	5.1	15.2	17.9	0	38.2	10	3.5	20.1	99						1
99 - 48 - 2	31.2	5	16.9	16.8	0.1	38.7	11	3.4	18.0	100						
00 - 33 - 17	33.4	10	18.6	24.9	0.1	53.5	5	4.7	20.3	100						
01 - 3 - 3	28	8.5	20.6	34.6	1.8	63.7	1	4.3	19.1	93					4	3
01 - 31 - 1	31.2	8.5	20.5	20.7	0.7	49.7	7	3.7	22.5	100						
01 - 34 - 19	35.7	5.8	20.2	21	0.5	47	6	4.5	18.7	99						1
01 - 46 - 27	28	5.4	19.4	29.4	0.1	54.2	3	3.4	20.1	99						1
01 - 46 - 53	31.2	6	16.5	21	1.3	43.5	8	3.6	20.0	95					1	4
01 - 83 - 38	31.2	8	18	27.1	1	53.1	4	4	18.5	99					1	
LSD [P=0.05]		N/A	6.3	5.1	N/A			0.5								

*Fry Colour at harvest (USDA colour chart)

Tasmanian variety evaluation trial 2005-2006.

Devonport district (Forthside) is one of the main delivery and storage district for McCain Foods Smithton processing plant. Planted in late October, the trial was lifted during April 2006.

Table 4
Forthside trial comparison of potato lines for different tuber yield weight grades, tubers per plant and processing parameters.

	Spacing	Yield, Tonnes per Hectare					Rank	Tuber	Quality					
	in Rows	Chats	Small	Large	Over Size	Fry Grade	by Fry	No. Per	Dry	Fry Colour *				
Entry	cm	0-100g	100-170g	170-340g	>340g	>100g	Grade	Plant	Matter %	0	1	2	3 4	Ends
Russet Burbank	30	7.8	17.5	12.6	2.1	32.2	4	8.4	23.6	100				3.3
Shepody	20	4.0	7.3	12.5	3.4	23.2	7	3.4	20.9	80	20			20
00 - 11 - 13	30	3.9	8.4	12.6	4.0	24.9	6	5.3	24.5	100				
00 - 33 - 10	30	5.2	11.2	16.1	4.0	31.3	5	7.0	26.4	93.3	6.7			13.3
00 - 33 - 15	30	5.6	12.7	20.7	5.4	38.8	1	8.0	22.1	96.7	3.3			3.3
00 - 33 - 17	32.5	8.1	15.9	16.7	3.5	36.1	3	9.8	25.1	64.4	35.6			3.3
00 - 34 - 3	30	5.0	12.9	18.7	6.7	38.3	2	8.2	25.0	100				3.3
LSD P=0.05		2.2	4.5	ns	ns	ns		2.0	1.3	19.7	19.7			ns
LSD P=0.01		3.1	6.4	ns	ns	ns		2.8	1.9	ns	ns			ns
CV%		21.7	20.8	22.2	62.5	19.6		15.9	3.2	12.2	117.9			173.7

* Fry Colour at harvest (USDA colour chart)

	Days to Maturity	**Quality**			**Hollow Assessment**					
		Bruise Ratings			**1st 10 Hollow %**	**1st 10 Brown Centre%**	**1st 10 total %**	**2nd 10 Hollow %**	**2nd 10 Brown Centre%**	**2nd 10 total%**
Entry		**Stem end**	**Rose end**	**Shatter**						
Russet Burbank	120	5.9	4.8	0.0	23	30	53	7	20	27
Shepody	117	4.1	3.3	0.0						
00 - 11 - 13	137	5.2	6.0	2.7						
00 - 33 - 10	146	6.4	6.4	1.7	3		3			
00 - 33 - 15	121	5.3	3.7	0.5	3		3			
00 - 33 - 17	149	5.6	5.0	3.0						
00 - 34 - 3	134	6.6	5.8	0.2	47		47	20		20
LSD P=0.05	3.2	1.3	1.7	1.4	13	18	23	10	13	ns
LSD P=0.01	4.5	ns	ns	2.0	18	ns	33	13	ns	ns
CV%	1.4	12.9	19.1	68.8	68	233	87	140	265	176

Tasmanian seed multiplication evaluation bulk trial 2005-2006.

Devonport district (Forthside) is one of the main delivery and storage district for McCain Foods Smithton processing plant. Planted in late October, the trial was lifted mid April 2006. No yield comparisons were taken, as it was not a replicated trial site.
A replicated trial will be undertaken next season on cultivars that are retained.

Table 5
Observation notes from Forthside seed multiplication plots.

Harvest comments. Forthside seed multiplication plots		
Cultivar	Comments at harvest	Target spot susceptibility (early March)
Daisy	odd stolon	severe
RB Ruen	odd crack, mishapes & distorts	
Shepody	poor shape & variable size, rots & scab	
01-31-1	good shape & size but too many pears???	moderate
01-34-19	odd stolon, too thin & variable shape	moderate
01-46-27	severe cracking, odd stolon, rots, scab	moderate
01-46-53	rots & scab	
02-30-9	excluding scab levels, a good even sample	
02-30-26	uneven shape, slight cracking	slight
02-3-15	stolons, cracking, very uneven & ugly sample, scab	moderate
02-39-2	too round?, even size & shape	moderate
02-58-7	poor shape & size uniformity, rots & scab	
02-69-29	too thin?, odd crack	moderate
02-71-37	good even shape & size but too small???	moderate
02-74-3	odd crack, variable shape & size	slight
02-76-8	good shape	slight
02-83-4	too few tubers!	
02-83-5	severe cracking, scab	moderate
02-83-16	hollow, cracks, odd stolon, scab	slight
02-91-3	odd mishapes & distorts	
02-92-14	too thin, mishapes	slight

Forthside seed multiplication plots.

Cultivar	*Flesh Colour*	*Days to Maturity*	*Quality*										
			Bruise Ratings			*Specific*	*% Dry*	*Fry Assessment*					
			Stem end	*Rose end*	*Shatter*	*Gravity*	*Matter*	*%0*	*%1*	*%2*	*%3*	*%4*	*Dark End%*	*Fry & Bruise comment*
Daisy	deep cream	130	1.9	0.9	0	1.092	22.6	100						yellow fry colour
RB	white	117	2.1	2.4	0.5	1.086	21.4	100						
Shepody	white	121	1.8	1.4	0	1.080	20.1	80	20				30	
01-31-1	off white	130	3.3	3.1	0	1.103	24.9	100						
01-34-19	deep cream	130	5.0	6.1	3	1.090	22.2	100						yellow fry colour
01-46-27	white	121	3.2	3.1	0	1.092	22.6	100					10	
01-46-53	white	117	5.0	2.9	0	1.094	23.0	90	10				10	
02-3-15	white	134	6.9	6.4	2	1.089	22.0	90	10					
02-30-9	white	117	6.4	4.3	1	1.097	23.6	90	10					
02-30-26	white	121	5.1	3.6	1	1.109	26.1	100						
02-39-2	white	121	4.0	1.5	0	1.089	22.0	100						
02-58-7	white	124	5.0	1.5	0	1.099	24.1	60	40				40	
02-69-29	white	124	4.8	5.5	0	1.097	23.6	100					20	
02-71-37	cream	127	3.5	2.1	0	1.092	22.6	100						pale yellow fry colour
02-74-3	white	134	6.2	5.8	1	1.102	24.7	100					20	
02-76-8	white	148	1.2	2.1	0	1.102	24.7	80	20				40	pale spot
02-83-4	white	117	2.6	1.1	0	1.100	24.3	100					10	pale spot
02-83-5	white	137	3.3	2.4	0	1.101	24.5	100					50	pale spot
02-83-16	off white	148+	5.9	2.7	0	1.123	27.4	88	13					pale spot
02-91-3	white	124	6.5	5.7	2	1.087	21.6	100						
02-92-14	white	145	5.9	5.0	1	1.111	26.6	100						