Know-how for Horticulture™

Potato variety improvement in New South Wales

Clarrie Beckingham
NSW Department of Primary Industries

Project Number: PT519

PT519

This report is published by Horticulture Australia Ltd to pass on information concerning horticultural research and development undertaken for the potato industry.

The research contained in this report was funded by Horticulture Australia Ltd with the financial support of the potato industry.

All expressions of opinion are not to be regarded as expressing the opinion of Horticulture Australia Ltd or any authority of the Australian Government.

The Company and the Australian Government accept no responsibility for any of the opinions or the accuracy of the information contained in this report and readers should rely upon their own enquiries in making decisions concerning their own interests.

ISBN 1 86423 791 0

Published and distributed by:
Horticultural Australia Ltd
Level 1
50 Carrington Street
Sydney NSW 2000
Telephone: (02) 8295 2300
Fax: (02) 8295 2399
E-Mail: horticulture@horticulture.com.au

© Copyright 1997

Know-how for Horticulture™

FINAL REPORT
HRDC PROJECT PT519

POTATO VARIETY EVALUATION in NEW SOUTH WALES

Project Coordinator
Clarrie Beckingham

NSW Agriculture
Bathurst, New South Wales
December 1996

Horticulture Research & Development Corporation

NSW Agriculture

Lanz Agricultural Consulting

Agriculture Victoria

POTATO VARIETY EVALUATION in NEW SOUTH WALES

Final Report

for

HRDC Project Number PT519

Project Coordinator
Clarrie Beckingham
December 1996

Funded By
Horticultural Research and Development Corporation

and

National Potato Levy

RESEARCH & DEVELOPMENT TEAM

Mr Clarrie Beckingham - District Horticulturist, NSW Agriculture
Bathurst NSW 2795

Ms Sandra Lanz - Consultant, Lanz Agricultural Consulting,
Bundanoon NSW 2578

Dr Roger Kirkham - Team Leader, Variety Improvement, Potatoes
Agriculture Victoria, Healesville VIC 3777

Mr Greg Ireland - District Horticulturist, NSW Agriculture
Coffs Harbour NSW 2450

Mr Stephen Wade - District Horticulturist, NSW Agriculture
Finley NSW 2713

Collaborating Potato Growers

Neville & Michael Tyler, Tyringham via Dorrigo NSW 2453

John & Marie Doyle, Claredale, Berrigan NSW 2712

Barry & Trevor Donovan, Rotherwood Rd, Robertson NSW 2577

Dorrigo potato growers Neville and Michael Tyler prepare to plant.

TABLE OF CONTENTS **Page**

1. Summary

1.1 Industry Summary 1

1.2 Technical Summary 2

1.3 Publication Schedule 3

1.4 Extension/adoption by industry 3

1.5 Directions for future research 4

1.6 Acknowledgements 5

2. Introduction 6

3. Materials and Methods 7

4. Results 9

5. Discussion 15

Berrigan potato grower John Doyle assists researchers assess varieties.

1.1 Industry Summary

The New South Wales fresh potato industry has endured a history of poor returns, oversupply, quality problems and difficulty addressing marketing problems and opportunities. Significantly a 20% decline in per capita of fresh potato consumption is predicted over the next 20 years. **The industry must change and have a new focus, new directions and new tasks that are market or client focussed.**

A potato variety evaluation project funded by the Horticulture Research and Development Corporation and National Potato Levy was conducted between July 1995 and June 1996 to:

- **improve producer awareness of consumer needs and producer opportunities,**
- **introduce, evaluate and provide producer access to new 'specialty' potato cultivars and**
- **undertake culinary quality assessment of a range of 'specialty' potato cultivars.**

Autumn harvest trials were grown at Dorrigo and Robertson and a winter trial at Berrigan in the southern Riverina and included a range of Dutch yellow fleshed cultivars with PCN and other disease resistances. Centurion was the highest yielder. It and another cultivar, Symfonia, have attractive red skins with yellow flesh, shallow eyes, good cooking qualities and would offer opportunity to replace Desiree. Kipfler which produced low yields, has good cooking qualities and potential as a gourmet potato. Sebago yielded very well and remains a good cooking potato for fresh market production, however its popularity is expected to be challenged by new PVR varieties like Saxon from the UK. Unsuitable (dark) colour after cooking was a problem in all lines tested for crisp processing.

The New South Wales fresh potato industry should have a strong vision and become strongly client focussed by:

* a pro active response to contemporary consumer attitudes and needs,
* exploiting the natural advantages of the state and
* closer liaison and cooperation with marketing specialists.

Market place opportunities include developing new domestic and export market segments, attractive descriptive packaging, point of sale literature and other marketing initiatives that identify the potato as a modern interesting vegetable.

The adoption by industry of this projects results, would be more easily achieved by:

* **an industry that is client focussed and develops closer links between producers and consumers through a peak NSW Potato Advisory Council.**
* **producers linking with vertically integrated potato firms which are market focussed,**
* **addressing problems and opportunities described in HRDC Project PT201 'Fresh Potato Marketing Research,' providing producers with a copy of this report and**

* **ongoing introduction and evaluation of promising new cultivars from local and overseas breeding programs. Culinary assessments should also include flavour, baking and microwave assessments.**

1.2 Technical Summary

A project funded by the Horticulture Research and Development Corporation and National Potato Levy was conducted between July 1995 and June 1996.

The objectives of this project, titled 'Potato Variety Improvement in New South Wales' (HRDC Project No PT519), were to:

- **improve producer awareness of consumer needs and producer opportunities,**
- **introduce, evaluate and provide producer access to new 'specialty' potato cultivars and**
- **undertake culinary quality assessment of a range of specialty potato cultivars.**

Autumn harvest trials were grown at Dorrigo and Robertson and a winter trial at Berrigan in the Southern Riverina. The trials included a range of Dutch yellow fleshed cultivars with PCN and disease tolerances.

Centurion was the highest yielder and along with another variety Symfonia, have attractive red skins with yellow flesh, shallow eyes, good cooking qualities and would be a suitable replacement for Desiree, subject to further commercial testing.

Kipfler a low yielding 'specialty' potato represents an important opportunity for developing new market niches at the top end of the market.

Sebago remains a good all round performer, however its position is expected to be challenged by new overseas PVR lines like Saxon from the UK.

This project also identified fresh potato marketing initiatives undertaken by specialists in potato marketing and provided producers with a knowledge of consumer needs.

Recommendations for the Board of the Corporation and research peers include:

* **to support further variety evaluation with more comprehensive quality and market place testing including: micro waving, baking and flavour assessment,**
* **provide HRDC Report PT201 to producers by supplying copies to regional grower groups for further reference,**
* **facilitating a strong client focus by**
  - **supporting NSW Potato Advisory Council industry development planning, (see page 19 for more details on Council)**
  - **periodic fresh potato marketing studies and feedback to industry,**
  - **the conduct of effective technology transfer,**
  - **supporting the development and adoption of quality management programs,**
  - **undertaking market discussion group activities in fresh potato districts, to improve communication through the marketing chain.**

1.3 Publication Schedule

The results of this project have been presented to clients and industry by group activities and mass media, ie.

* **Group activities**, (Producer Information Seminars)
  - Dorrigo District, April 1996
  - Riverina District, Finley, September 1996
  - Robertson District, Robertson, February 1996
  - Central Tablelands, November 1996
* **Mass Media** (see appendix)
  - News Release - "Fresh Approach for Potato Industry"
  - Radio Interviews
    - ABC (2CR, 2BL) March 1996
    - ABC (2CR) June 1996
    - 2SP, 1996
  - Newspaper Features
    - "Bangers & Purple Congo for Dinner," The Sun Herald, July 1996
    - "Fresh Approach for Potato Industry" Agriculture Today, July 1996
* **State Conference** - NSW Vegetables Conference "Potatoes in Australia, Past, Present, Future" August 1996
* **National Conference Papers** (poster)
  - Vegtec 2000, 1996 National Vegetables & Potato Industry Conference, July 1996 "Fresh Approach for the Potato Industry, variety evaluation in New South Wales."
* **Papers to be Submitted** - draft to be submitted to following publications by February 1997
  - Good Fruit & Vegetables
  - NSW Potato News
  - 1st meeting NSW Potato Advisory Council (April)

1.4 Extension/adoption by industry

Findings from this report is justification for the New South Wales fresh Potato industry to develop a business plan and become market focussed.

Extensive industry awareness was undertaken, providing producers with a knowledge of project objectives and results and in particular new opportunities for fresh potato marketing. An important component of the extension program was the discussion relating to HRDC Project PT210.

This project has introduced to the industry superior varieties with distinctly different culinary qualities, including pest and disease resistances.

Important links have been promoted between client focussed potato market specialists and industry.

A peak NSW Potato Advisory Council would be important for future industry development.

Robertson district has many desirable features for potato growing.

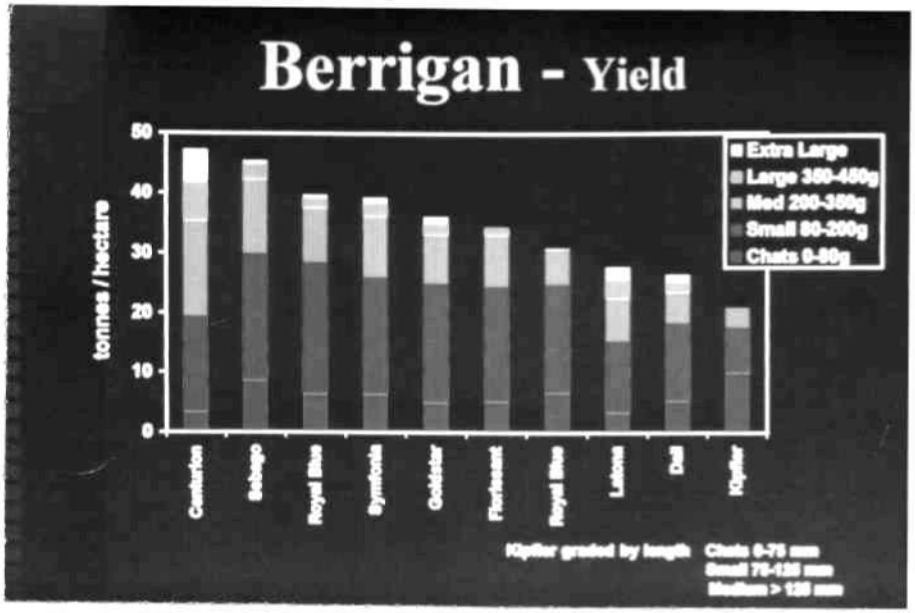
1.5 Directions for Future Research

* Field trial results for this project will be included in the annual publication "Potato Cultivar Trials in Australia," and ongoing variety evaluation is necessary for the New South Wales fresh potato industry development. Promising new releases from local and overseas breeding programs should be evaluated comprehensively not only in the field but also in the market place.
* Quality management remains a major opportunity for the fresh potato industry to embrace in New South Wales and a QM program "Potato Care" is needed.
* A number of marketing opportunities can be investigated eg, organic production, developing closer links between producers and consumers, developing new market segments and products for the domestic and export industry.
* Consumer orientated (client focussed) and market focussed fresh potato industry development is necessary and achievable, particularly when guided by effective state organisation. New South Wales potato growers need to support a peak state body that facilitates close links with buyers and has purpose and a strong vision. Regional producer groups need to develop coordinated market focussed activities.

1.6 Acknowledgments

The investigation team for this project would like to acknowledge the assistance of the following industry people and organisations, whose generous contributions ensured the success of the project.

* **Sandra Lanz,** *Lanz Agricultural Consulting NSW (extension and adoption)*
* **Graham Liney**, *Willowvale Potatoes,* (*Marketing advice*)
* **John & Marie Doyle**, *Berrigan,* (*Grower cooperator*)
* **Barry & Trevor Donovan**, *Robertson (Grower cooperator)*
* **Neville & Michael Tyler,** *Dorrigo (Grower cooperator)*
* **Horticulture Research & Development Corporation** *(Funding)*
* **Australian Potato Industry Council** *(Funding)*
* **NSW Agriculture:**
  - *Stephen Wade - (conduct of experiments and extension)*
  - *Greg Ireland - (conduct of experiments and extension)*
  - *Adrian Lynch - (conduct of experiments)*
  - *Suzanne Pearce - (typing of final manuscript)*
  - *Belinda Gersbach - Colour graphics and slides*
* **Agriculture Victoria**
  - *Roger Kirkham - (cooking tests, experimental advice, computer analysis).*



Promising varieties produced good yields and were suitable for Riverina double cropping.

2 INTRODUCTION

NSW potato growers have received poor returns for their fresh market potatoes during recent years. Many retail outlets are using potatoes as a "loss leader" - which means that low prices are inevitable. Supermarket buyers have identified Coliban as the benchmark washed, bright white skinned variety. However Coliban is regarded as having very poor boiling quality and boiling tests on samples from many variety trial sites verify this. Coliban is not widely grown in NSW. A new approach to potato variety improvement is required, which draws on contemporary consumer attitudes, the natural advantages of the NSW potato sector, and the exploitation of new, "specialty" potato cultivars.

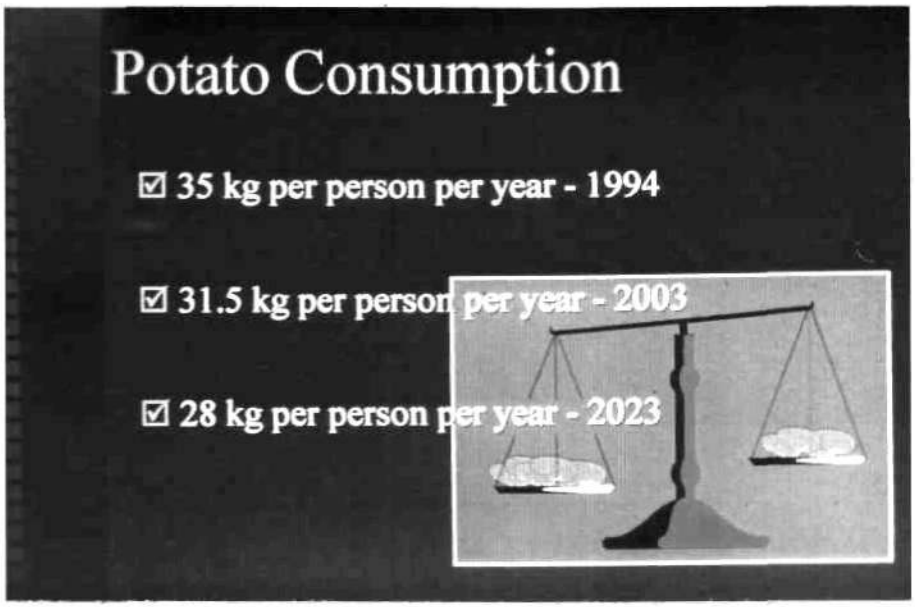
The natural advantages of the NSW potato industry include the ability to supply freshly harvested potatoes, (from various districts), to the market for many months of the year, close proximity to the nation's largest fresh markets, and a seed scheme with world-leading technology for rapid introduction of new cultivars.

The potato industry's fresh market research indicated that there was a need to present potatoes as a modern interesting vegetable.

This project included a series of grower meetings to discuss developments in fresh potato marketing and results of variety evaluation in the major potato growing districts of New South Wales.

New varieties with distinctly different culinary qualities were placed in replicated trials and assessed in the field, in cooking tests, in tasting panels during grower information seminars and in collaboration with fresh potato marketing specialists.

Dr Roger Kirkham form Agriculture Victoria, collaborated by selection of potatoes with distinctly different culinary qualities, Ms Sandra Lanz, Lanz Agricultural Consulting assisted with technology transfer and Mr Graham Liney, Willowvale Potatoes, Crookwell provided valuable marketing advice.



Long term per capita potato consumption predictions need to be acted upon.

3 MATERIALS AND METHODS

This project involved the following methods:

3.1 Technology Transfer

A series of producer seminars were conducted in significant fresh potato districts to discuss:
- results of HRDC Report PT210 "Fresh Potato Marketing Research"
- variety evaluation in Australia
- variety improvement in NSW
- new developments in fresh potato marketing
- variety trial results, inspection and tasting of new distinctly different potato varieties.

As well, important awareness of project activities and outcomes was established through:
- mass media (print and radio) publicity
- industry journals and
- national and state conferences

Robertson potato growers review trial varieties at an information seminar.

3.2 Variety Evaluation - field experiments and culinary tests

Promising varieties from breeding programs released for evaluation in this project under commercial field and market conditions went through a thorough process of review from paddock to plate.

Varieties were assessed:

- in the field under a range of climates to determine suitability and yield, tuber quality, plant characteristics, tuber set, uniformity of tuber size, disease resistance and suitability as a fresh, or dual purpose type.
- after harvest for culinary features before and after cooking and
- in the market place by potato marketers.

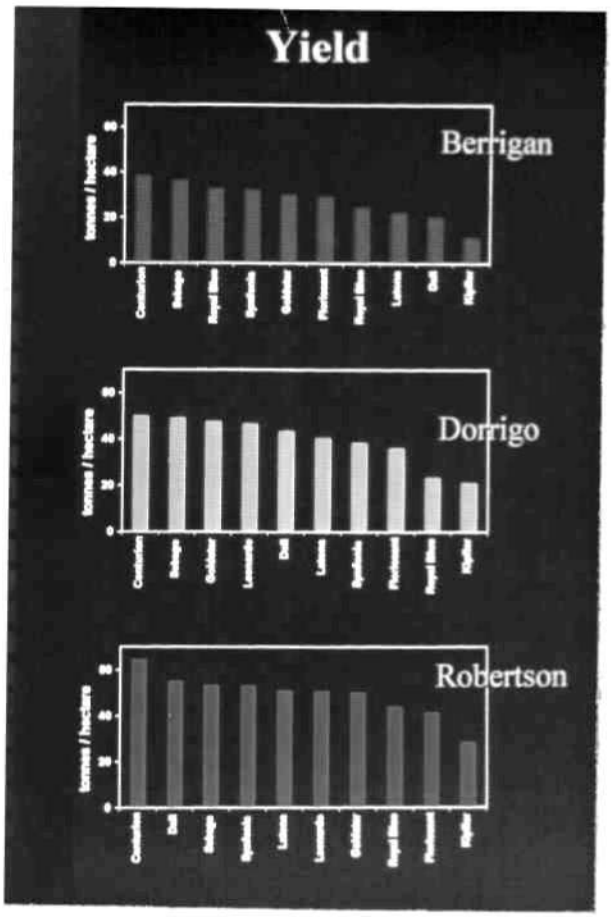
Potato producers, researchers, marketing specialists and advisors collaborated during the assessment process.

The Horticulture Research and Development Corporation, Australian Potato Industry Council, NSW Agriculture, Lanz Agricultural Consulting and Agriculture Victoria facilitated evaluation of the varieties. The Dutch varieties were supplied by the Harvest Moon company from Tasmania and included a number of DeZPC lines under Plant Breeders Rights.

This project was part of the National Potato Improvement and Evaluation Scheme.

Replicated autumn harvest trials were grown at Dorrigo and Robertson and a winter trial at Berrigan in the Riverina.

The trials included eight Dutch yellow fleshed cultivars with PCN and other disease resistances, Kipfler a special purpose (gourmet) variety and Sebago a popular general purpose variety.



Yield of No. 1 grade was consistently high in all districts for Centurion, Sebago and Symfonia.

4 RESULTS

4.2 Robertson Autumn Fresh Potato Trial 1995/96

Location: Robertson, New South Wales
Elevation: 700m
Soil Type: Red Basaltic Clay Loam
Spacing: Rows 90 cm Plants 25 cm
Planted: 27 November 1996
Harvested: 2 May 1996
Soil Temperature at harvest: 12.8°C

TABLE 1 ROBERTSON								
YIELD tonnes/hectare								
Variety	Rank No 1 Grade	No 1 Grade Tonnes	Chats 0 - 80g	Small 80 - 200g	Med 200 - 350g	Large 350 - 450g	Extra Large	Tuber No. Plant
Centurion	1	64.8	2.5	31.9	29.2	3.7	1.0	8.9
Dali	2	55.2	4.1	37.2	17.0	1.0	1.2	9.6
Sebago	3	53.5	2.5	24.1	23.9	5.5	0.6	7.1
Symfonia	4	53.2	2.1	23.6	27.6	2.0	1.5	7.1
Latona	5	51.1	3.6	25.4	24.6	1.2	0.8	7.5
Leonardo	6	50.9	2.4	23.0	24.0	3.9	3.6	6.7
Goldstar	7	50.3	3.2	30.0	17.0	3.3	1.9	7.7
Royal Blue	8	44.0	3.9	31.6	11.6	0.9	-	8.0
Florissant	9	41.6	10.0	34.6	7.0	-	-	10.6
Kipfler	10	28.7	18.1	22.2	6.5	-	-	19.4

Table 1 ROBERTSON							
COOKING TESTS							
Variety	SG	DM	Crisp Score	Colour	ACD	Slough	Soft
Centurion	1.074	18.9	9.0	4.0	3.0	1.3	3.0
Dali	1.076	19.2	7.3	5.0	3.3	1.0	2.3
Sebago	1.082	20.6	6.7	1.0	2.3	3.0	3.0
Symfonia	1.095	23.3	7.0	4.0	4.0	3.7	3.0
Latona	1.078	19.6	7.7	4.0	3.3	2.3	2.3
Leonardo	1.080	20.1	8.0	1.7	2.3	1.7	2.7
Goldstar	1.091	22.3	5.7	3.7	2.3	3.3	3.0
Royal Blue	1.090	22.2	5.3	5.0	3.3	2.3	2.0
Florissant	1.102	24.7	6.3	3.7	2.3	3.7	2.0
Kipfler	1.092	22.5	7.0	4.0	3.0	2.0	3.0

Note: for Robertson, Dorrigo and Berrigan trial sites:

* Kipfler graded by length Chats 0 - 75 mm
  Small 75 - 125 mm
  Medium > 125 mm

* The number one grade for fresh market potatoes is for tubers weighing 80-450 gm. Cooking (boiling) quality is a major criteria in selection of varieties and parameters measured include disintegration when cooking, after cooking darkening and texture when cooked.

At Robertson good rainfall was recorded during the growing period contributing to high yields. Most promising varieties were the Dutch ZPC red skinned, yellow fleshed line, Centurion and Symfonia and are possible replacements for Desiree, subject to further commercial testing. Royal Blue and Kipfler yielded lower but have potential for special purpose (gourmet) markets. Sebago yielded highly and remains a popular white fleshed variety.

4.2 Dorrigo Autumn Fresh Potato Trial 1995/96

Location: Tyringham, (Dorrigo), New South Wales
Elevation: 780 m
Soil Type: Red Clay Loam
Spacing: Row 85 cm Plants 23 cm
Planted: 10 October 1996
Harvested: 28 March 1996
Soil Temperature at harvest: 15.9°C

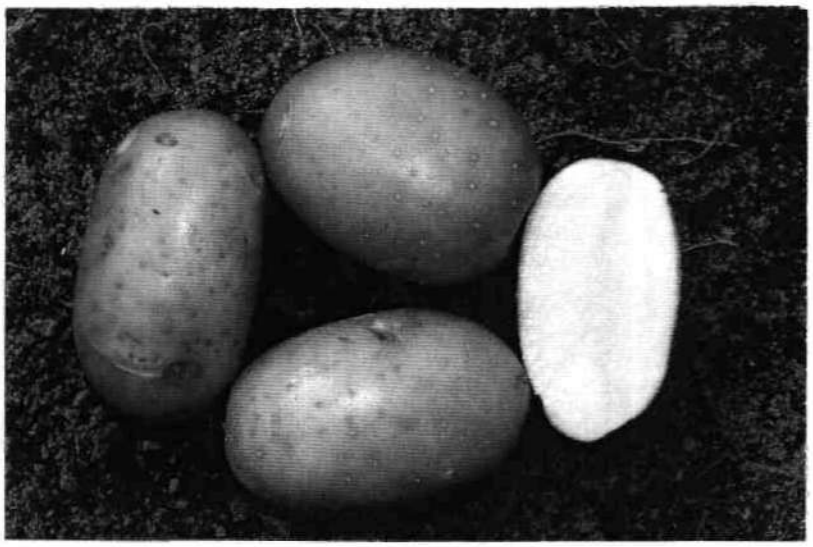
TABLE 2 DORRIGO

YIELD tonnes/hectare

Variety	Rank No 1 Grade	No 1 Grade (Tonnes)	Chats 0 - 80g	Small 80 - 200g	Med 200 - 350g	Large 350 - 450g	Extra Large	Tuber No. Plant
Centurion	1	50.0	3.8	29.2	17.2	3.6	-	7.4
Sebago	2	49.1	5.5	34.8	13.2	1.1	-	8.6
Goldstar	3	47.5	4.7	24.5	19.2	3.8	-	7.3
Leonardo	4	46.5	5.1	26.0	16.1	4.4	-	7.3
Dall	5	43.3	10.5	33.0	8.7	1.5	-	9.7
Latona	6	40.5	6.4	25.0	13.3	2.1	-	7.2
Symfonia	7	38.4	6.8	27.6	10.0	0.9	-	7.6
Florissant	8	36.1	10.8	29.1	6.2	0.7	-	9.8
Royal Blue	9	23.5	11.0	22.8	0.7	-	-	8.7
Kipfler	10	21.0	8.7	11.2	9.8	-	-	11.4

Table 2 DORRIGO							
COOKING TESTS							
Variety	SG	DM	Crisp Score	Colour	ACD	Slough	Soft
Centurion	1.067	17.4	9	5	1	1	3
Sebago	1.074	18.8	5	2	1	1	2
Goldstar	1.074	18.8	6	4	2	1	2
Leonardo	1.062	16.3	7	3	1	2	3
Dall	1.055	15.0	9	5	2	1	2
Latona	1.068	17.7	8	4	2	1	3
Symfonia	1.085	21.2	9	5	3	1	2
Florissant	1.084	20.8	8	3	1	2	2
Royal Blue	1.075	19.1	5	5	2	1	4
Kipfler	1.080	20.1	7	4	2	1	3

At Dorrigo, warm, dry weather was experienced during the early part of the growing season. Good yields were recorded and Dutch ZPC lines, the red skinned, yellow fleshed Centurion and Symfonia performed well and are possible replacements for Desiree subject to further commercial testing. Royal Blue and Kipfler also yellow fleshed have potential as special purpose 'gourmet' varieties, although Royal Blue was noticeably affected by a skin discolouration possibly influenced by soil type, climatic conditions and time inground. Sebago remains a good white fleshed variety. The Dutch line also have pest and disease resistances.



Centurion, the highest yielding, yellow fleshed, variety with good cooking qualities.

4.3 Berrigan Winter Fresh Potato Trial 1995/96

Location: Berrigan, New South Wales
Elevation: 100 m
Soil Type: Sand mount Sand
Spacing: Rows 81 cm Plants 23 cm
Planted: 8 February 1996
Harvested: 1st July 1996
Soil Temperature: 9°C

Table 3 BERRIGAN

YIELD tonnes/hectare

Variety	Rank No1 Grade	No 1 Grade (Tonnes)	Chats 0 - 80g	Small 80 - 200g	Med 200 - 350g	Large 350 - 450g	Extra Large	Tuber No. per plant
Centurion	1	38.3	3.4	16.0	15.8	6.5	5.6	5.0
Sebago	2	36.3	8.3	21.3	12.2	2.8	0.6	7.9
Royal Blue	3	32.8	6.3	22.2	8.9	1.7	0.6	6.4
Symfonia	4	32.0	6.3	19.7	10.0	2.3	1.0	6.0
Goldstar	5	30.0	5.0	20.0	8.0	2.0	1.1	5.4
Florissant	6	29.2	5.2	19.3	8.5	1.4	0.2	5.5
Royal Blue	7	24.4	6.6	18.3	5.7	0.4	0.2	6.4
Latona	8	22.2	3.4	12.0	7.0	3.2	2.2	3.9
Dali	9	20.0	5.3	13.1	5.0	1.9	1.2	4.5
Kipfler	10	11.1	9.9	7.8	3.3	-	-	4.3

Table 3 BERRIGAN

COOKING TESTS

Variety	SG	DM	Crisp Score	Colour	ACD	Slough	Soft
Centurion	1.063	16.5	10	3.7	1	1	2.3
Sebago	1.062	16.3	8.3	1	1.3	1.3	2.3
Royal Blue	1.065	16.9	8	3	1.7	1	3
Symfonia	1.070	18.0	9.3	3	1	1	2.7
Goldstar	1.073	18.7	8.7	2.7	1	1	2.7
Florissant	1.082	20.6	7.3	2.7	1	2.3	3
Royal Blue							
Latona	1.068	17.7	9	3.7	1.3	1	3
Dali	1.059	15.7	10	4.7	1.3	1	3
Kipfler	1.069	17.9	7.7	3	1	1	3

Berrigan Harvest Assessments Comments

Variety	
Royal Blue	Green tops, fair yield, good deep blue skin colour.
Symfonia	Good yields, large elongated tuber size, pale skin colour.
Centurion	Green tops, smooth skin, lenticel marks, darker skin colour than Symfonia but still pale
Leonardo	NOT SOWN
Latona	Textured skin, growth cracks, lenticel free.
Dali	Green tops, growth cracks, textured skin, uneven tuber size.
Goldstar	Oblong shape, deep lenticels, hard to cut, hollow head.
Florrissant	Smooth, yellow sheen on skin, dark eye, growth cracks, stem end rot, some green tops.
Kipfler	Some green tops, very small tuber size, some secondary growth.
Sebago	Large tuber numbers, fleck.

Note: All varieties proved to be suitable for the Riverina and in particular double cropping management.

4.4 Varietal Characteristics

A summary of varietal characteristics is listed in Table 5. A feature of the varieties Centurion, Symfonia and Royal Blue was their suitability for washing, shallow eyes and attractive appearance, Royal Blue was affected by skin russetting and if harvested early or grown in sandy soils there is less likely of this problem occuring.

Table 5: VARIETAL CHARACTERISTICS*

VARIETY	MATURITY	SKIN	FLESH	GOLDEN NEMATODE RESISTANCE (RACE RO 1)
Royal Blue	M	Purple	Dark Yellow	R
Symfonia	M	Red	Yellow	R
Centurion	L	Red	Yellow	R
Leonardo	L	Yellow	Yellow	R
Latona	E	Yellow	Yellow	R
Dali	M	Yellow	Yellow	R
Goldstar	M	Yellow	Light Yellow	R
Florissant	M	Yellow	Light Yellow	R
Kipfler	NA	Yellow	Cream	NA
Sebago	L	White	White	S

NB● Maturity E 85-90 days M 110-115 days L 120-125 days
- In Dutch trials Symfonia had resistance to common scab and was reported to have resistance to powdery scab.

* For more details on Dutch varieties contact Harvest Moon, Tasmania. Telephone 03 6428 2505.

Cooking Tests- were conducted by National Potato Improvement Centre at Healesville Victoria. Table 6 describes the assessment standards.

Table 6 COOKING CHARACTERISTICS SCORE SHEET

BOILING TEST			CRISP FRY TEST			
TEST		DESCRIPTIVE TERMS	FRENCH FRY RATING	DESCRIPTIVE TERMS	SCORE	CRISP RATING
Basic colour	1	White	Too light	White	1	Too light
	2	Creamy White				
	3	Cream		Very Light Yellow	2	
	4	Deep cream				
	5	Yellow				
Greying & after cooking darkening	1	nil				
	2	Slightly Grey		Light Yellow	3	Desired colour
	3	Moderate, greyish black				
	4	Marked blackening around eyes &/or stem end.		Yellow	4	
	5	General blackening	Desired colour			
Disintegration and sloughing	1	Nil, surface smooth & translucent.		Light Gold	5	
	2	Slight, surface dull but mainly intact.				
	3	Moderate, major part of surface sloughed off but mainly intact.		Gold	6	Borderline
	4	Severe, floury mass.				
	5	Severe, soupy.				
Softness			Borderline	Dark Gold	7	
	1	Firm, do not readily break up when tested with fork.				
	2	Fairly firm, can be broken in large lumps which retain a strong cohesion.		Brown	8	Too dark
	3	Fairly soft, can be broken apart easily.	Too dark	Dark Brown	9	
	4	Soft, breaks easily up into mass of glistening crumbs with little cohesion.				
	5	Very soft, breaks easily up and mashed into a slurry.		Black	10	

5.0 Discussion

5.1 Outcomes

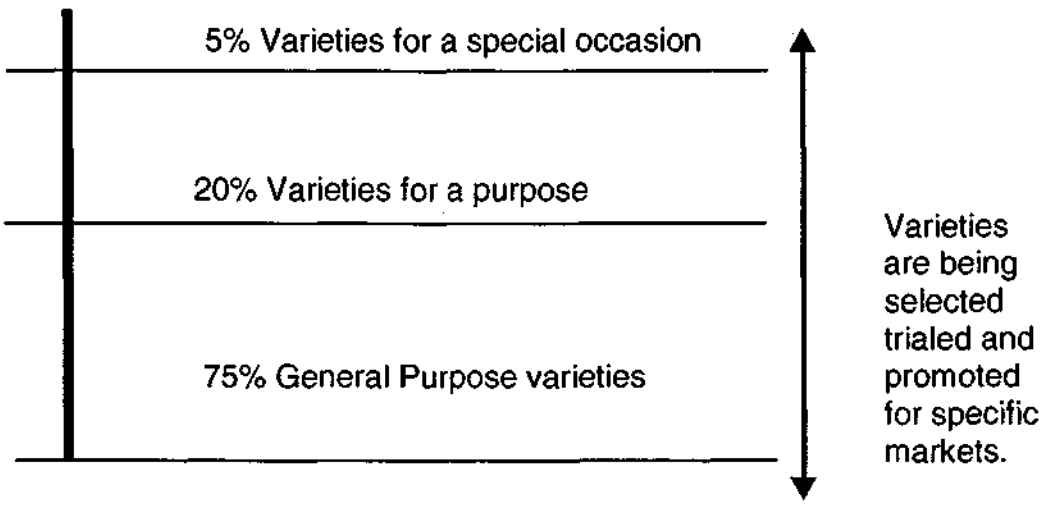
The outcomes of this project were:

- **improved grower awareness of consumer needs and grower opportunities,**
- **introduction, evaluation and producer access to new 'specialty' potato cultivars with distinctly different culinary qualities and**
- **culinary quality assessment of a range of potato cultivars.**

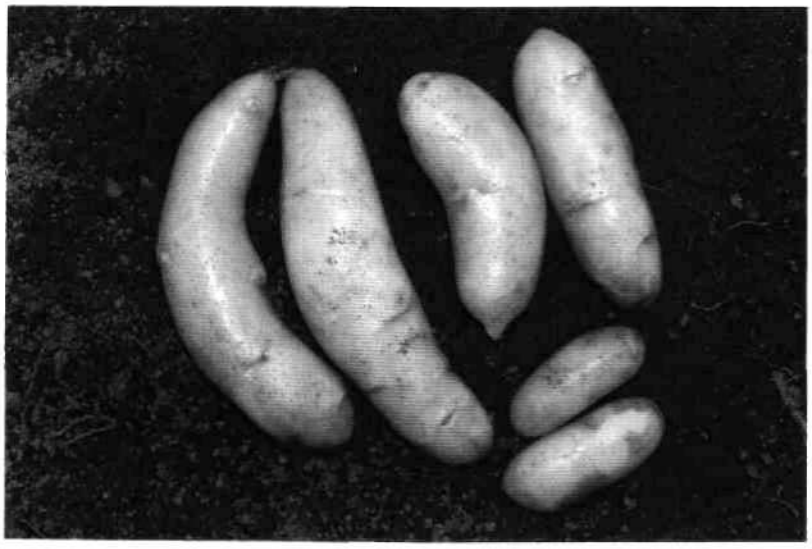
5.2 Varieties

A number of varieties that performed well in this project have the potential to suit a range of market niches as described below.

Diagram 1 **Fresh Potato Market Segments**

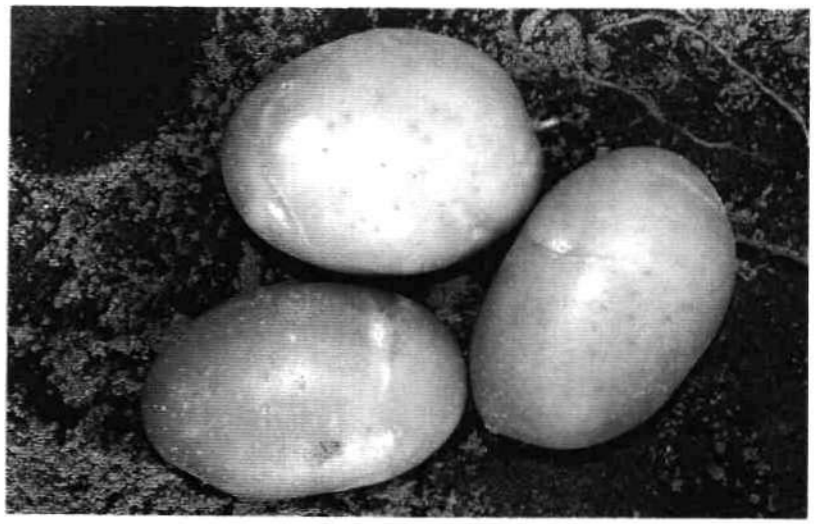


The new Dutch De ZPC varieties, Centurion and Symfonia, which were assessed for yield and cooking qualities offer not only a higher yielding replacement for Desiree but also have pest and disease resistance to such problems as nematodes, scab and blights. They represent a new development for the potato industry firstly by introducing to the potato industry PVR considerations and also by increasing the range of yellow fleshed types available by a significant margin. They and others like Royal Blue and Goldstar have potential for the washed prepack market where attractive appearance and good cooking qualities are important.



Kipfler, a promising 'specialty' variety.

Kipfler represents a new opportunity for producers in a market where an increasing range of colours, shapes and flavours are being used to develop a niche in the market for varieties described as 'gourmet,' 'speciality' or 'salad' potatoes. Pink Fir Apple, Roseval, Ratte, Nicola and Purple Congo are further examples of varieties which are forging a new identity for the fresh potato as a modern interesting vegetable.



Symfonia produced good yields, is attractive and well suited to washing.

To obtain maximum performance from the varieties tested in this project, cultural requirements should be included in the process of evaluation under different climates and management.

Royal Blue an attractive yellow fleshed variety.

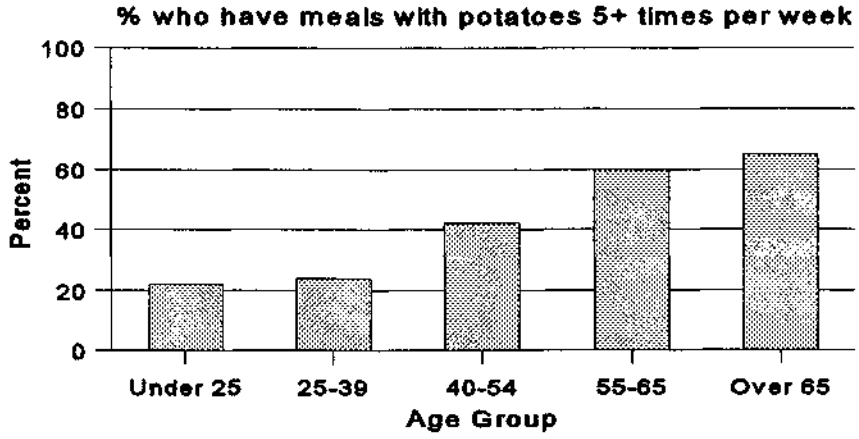
For example a standard plant spacing of 25 cm and row spacing of 85-90 cm would be desirable for optimum plant growth and yield. Attention to irrigation and fertiliser management is also important for good performance from these varieties.

Low yielding varieties like Kipfler may need to be planted closer in row, down to 15 cm. It will be important for the fresh potato industry to have access to new and promising varieties by sourcing planting material for local testing not only from local but also from overseas breeding programs. The NSW Potato Advisory Council could help coordinate this process.

5.3 HRDC Marketing Report

Fresh Potato Marketing Report - the findings of this report offer some significant challenges and opportunities for the fresh potato industry in Australia and important results from the report discussed with producers during the project included:

Diagram 2



Potato consumption:

- 35 kg per person per year - 1994
- 31.5 kg per person per year - 2003
- 28 kg per person per year - 2023

Why Consumption is Falling

- Lack of promotion
- Lack of market development
- Lack of value adding
- Changing demographics
- Increased competition

Changing demographics

- Both partners are working
- Less time for shopping
- Less time for cooking
- Single person households
- Eat out more often
- Greater disposable income
- Ethnic groups

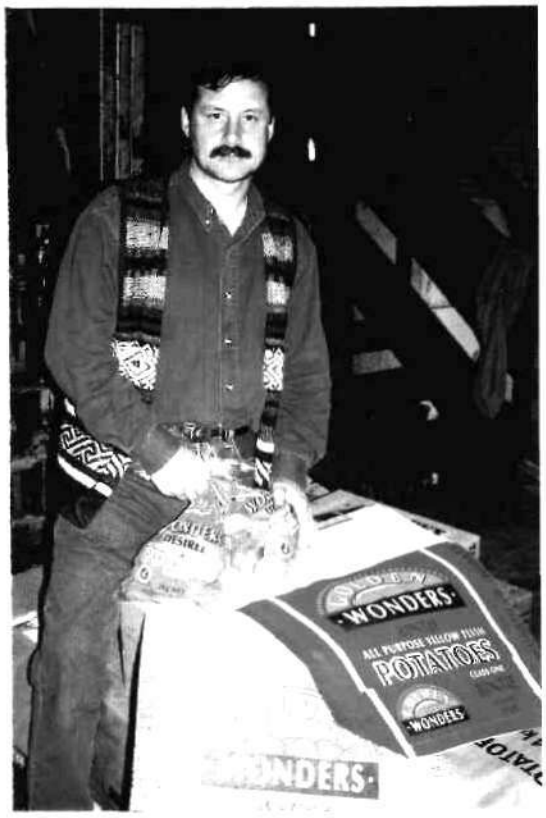
5.3.2 Trends in the market place

At the recent NSW Vegetables Conference, Graham Liney (Willowvale Potatoes) spoke of some important initiatives taking place in fresh potato marketing. Mr Liney predicted that:

* Supermarkets are expected to become increasingly important and already approximately 60-70% of vegetables sold are marketed in supermarkets. Supermarket standards are very high.
* The top 25% of the market is a specialist one and is as profitable as the bottom 50%.
* New potato varieties will be handled by potato specialists who will:
  - aim to get good growers,
  - indicate what varieties are needed and
  - supply seed.

  ie: vertically integrated operations.

* The Golden Wonders® brand, has been the first to go with a new approach using:
  - branded lines
  - market specialisation
  - developing a new potato image and
  - new varieties which are named and sold punnetted, loose or bagged.



Graham Liney a potato grower and specialist in potato marketing displays the Golden Wonders brand.

5.3.3 Market Opportunities

The New South Wales fresh potato industry, should be working more closely with marketing specialists and developing a client focus.

New PVR varieties, along with older types being revived, can improve the fresh potato image and generate new enthusiasm amongst consumers.

Understanding variety suitability for market niches is important. Closer links between growers and consumers should be encouraged to complement the creation of a new personality for the potato. A New South Wales Potato Advisory Council could work positively in this direction. The Councils proposed role would be:

- provide a platform for industry unity,
- provide representation to national organisations,
- provide strong links from producer to consumer,
- be market focussed, committed to achieving market growth and customer needs,
- foster best practices and innovative technology.

The potato industries image in New South Wales is being enhanced by specialist brands like Golden Wonders. The potato is being promoted as a modern interesting vegetable, available all year round. Consumers have attractively packaged potatoes with descriptive information including varietal naming and their suitability for culinary purposes. Point of sale literature can be found in a few retail outlets.

Whether for baking, roasting, boiling, mashing, wedges, chips or scallops the fresh potato is now available in an increasing range of colours and shapes and is being marketed by some enthusiastic marketers, who are providing the potato with a new image.

Attractive descriptive packaging and a faster launch into the market place is also expected to help develop the fresh potato market. Desiree, and other varieties have taken up to 15 years to become established in the market. In future, co-ordination of supply and promotion between marketing specialists and producers will result in consumer acceptance within 12 months of release of a new variety into retail outlets.

Some very attractive washed potato varieties currently available have poor cooking qualities and Coliban is an example. Improved consumer education, will in future, test the credibility of some of these existing well established varieties which sell well by eye appeal. The potato after all needs to be cooked for maximum appeal.

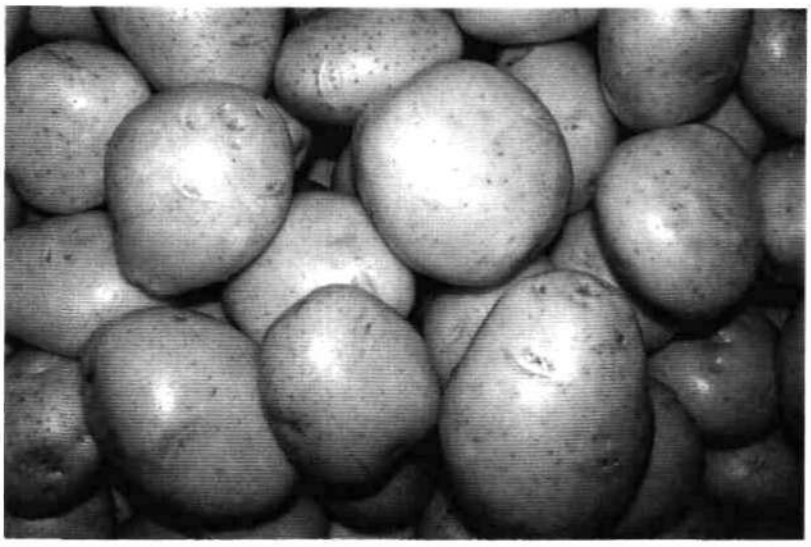
Attractive descriptive pack sizes suitable for maintaining a "Potato Pantry" storage.

The popularity of the red skinned Pontiac variety is being questioned as consumers note the deep eyes and failing colour. Bison, Red Lasoda and Rideau are currently attractive alternative red skinned varieties with shallow eyes for easier peeling. Desiree has recently replaced Pontiac as the most popular washed red skin variety.

The new Dutch De ZPC Centurion and Symfonia, (both red skinned) Royal Blue and Goldstar have shallow eyes, are yellow fleshed and are expected to become more popular with consumers and growers looking for a good looking potato that tastes good and looks good.

Other varieties, popular in Europe and the UK either as new or long standing fresh market types, will be tested more frequently under our local conditions. For example, Saxon from the UK has potential to replace Sebago in the general purpose market and is reported to have desirable agronomic features that will please producers and packers alike.

Consumer needs and product specification should become the fresh potato industries priority and these needs should be monitored.



Washed Coliban potatoes are very attractive but have poor culinary qualities.

Potato marketing specialists are identifying new opportunities in the various market niches, (diagram 1) and it will be important for producers to link in with these specialists who have a focus on industry development beginning with the market place.

5.3.4 Quality Management

The development of a 'Potato Care' quality management program and adoption by the New South Wales fresh potato industry would represent a significant opportunity for developing domestic and export markets.

Quality management, based on SQF 2000 and HACCP would provide industry with a strong vision and most importantly a strong client focus with all sectors in the marketing chain playing a part in providing a product that meets customer specifications.