

PT96015

**Selection and evaluation of potato cultivars
in Queensland**

**S M Harper and W O'Donnell
Queensland Horticulture Institute**



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PT96015

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Selection and evaluation of potato cultivars in Queensland

Project No. PT 96015

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Queensland Horticulture Institute
Gatton Research Station



September, 2000

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1. Media Summary

The Queensland potato industry is shifting from traditional brushed markets to washed market production. Although some new varieties have been developed to meet this market change (Snowgem and Red la Soda) there is a need for better suited varieties. This project has developed new varieties with potential for washing and export markets.

The named varieties due for commercial release include Ruby Lou and Shine. Ruby Lou is a high yielding red skin white fleshed variety. Shine has only been evaluated in 1 season but performed well. It will require further evaluation and growers in Queensland are advised to trial small amounts (e.g. about 1 tonne) when available. White Rhino (86-31-5) is a high yielding variety in northern Queensland but suitable for brushed and export trade only.

A new line, 92-19-6 (a sister line to the advanced Victorian lines 92-19-4 and 92-19-10) has demonstrated exceptional skin presentation for washing and very high yield potential. This line also appears to have virus tolerance but is sensitive to brown fleck. Growers may wish to trial small amounts of 92-19-4 and 92-19-10 once available.

Recently, the lines 96-29-5 and 96-87-2 (red skinned) and 96-32-15 and 96-32-8 (white skinned) have exhibited high yield of quality washed tubers. Other novelty lines with various shades of skin colour have also been evaluated in the last season.

In early trialing of the lines 93-14-4, 93-17-16, 93-36-1 and 93-124-10 yield was very good. These lines subsequently contracted virus, which dramatically reduced yield. These lines need to be cleaned of virus and re-evaluated. Their parentage would indicate suitability for washing.

Given the changes in potato marketing from brushed towards a washed trade there is a need for the Queensland potato industry to develop washed lines suitable for tropical production.

2. Technical Summary

Increasingly the Queensland potato industry is shifting from traditional brushed markets to washed market production. Although some new varieties have been developed to meet this market change (Snowgem and Red la Soda) the industry is still very reliant on traditional varieties such as pontiac and sebago. These varieties are largely unacceptable as washing lines and are unreliable for washing quality from season to season.

Breeding material in the present project was bred or introduced under the National Potato Improvement and Evaluation Scheme. Each of the new lines was evaluated under Queensland conditions via a series of replicated field experiments.

This project has evaluated new varieties with potential for washing and export markets. The named varieties due for commercial release include Ruby Lou and Shine. White Rhino (86-31-5) shows excellent yield potential in northern Queensland but suitable for brushed trade and potentially export only.

The line 92-19-6 is a sister line to the advanced Victorian lines 92-19-4 and 92-19-10. It has demonstrated exceptional yield and skin presentation having a bright shiny appearance and few lenticels. This line also appears to have virus tolerance or resistance. However a major detraction is its apparent sensitivity to the disorder brown fleck. This aspect of this line needs thorough evaluation. All three lines show good potential.

Recently, the lines 96-29-5 and 96-87-2 (red skinned), and, 96-32-15 and 96-32-8 (white skinned) have exhibited high yield of quality tubers. Other novelty lines with various shades of skin colour have also been evaluated in the season 1999/2000.

In early trialing of the lines 93-14-4, 93-17-16, 93-36-1 and 93-124-10 yield was very good. These lines subsequently contracted virus, which dramatically reduced yield. These lines need to be cleaned of virus and re-evaluated. The parentage of these would indicate their suitability for washing.

Given the changes in potato marketing from brushed towards a washed trade there is a desperate need for the Queensland potato industry to develop washed lines suitable for tropical production and high value export markets that require washed tubers.

The development of new varieties to meet market requirements is critical if the Queensland fresh market potato industry is to remain competitive.

However, in considering this it is recommended that in future some fundamental issues be addressed. The program needs to focus on producing good washed lines. Dual market varieties that will both wash and chip are desirable as the standard for washing potatoes is very high and growers need an alternative market in the event their product does not meet specification. Future Queensland varietal evaluation programs need to have a commercialisation strategy built in with the requirements of retailers duly considered when assessing varieties.

In future Queensland trials fresh seed material needs to be sourced each year. This seed should be produced in recognised seed districts that are capable of supplying early seed, preferably between February and April. Also, Queensland scientists should be playing a greater role in identifying good parent breeding lines and directing the types of crosses required to meet Queensland conditions.

3. Introduction

The Queensland potato industry has changed substantially in the past 10 years. Production in traditional areas such as the Lockyer Valley has declined whilst production has increased in newer areas including the Darling Downs and Bundaberg as well as the traditional production region of the Atherton Tableland.

The markets supplied by Queensland include Fresh market washed and brushed (70%) and the processing crisp market (30%). Having said this, much of the Sebago crop although grown for the fresh market is ultimately sold into the processing chip market.

With the inception of the National Potato Improvement and Evaluation Scheme (NaPIES) in 1992 potato varietal improvement was identified as a key industry focus and has continued as such up to the present. In Queensland this focus has been to evaluate cultivars that are multi-purposed and ideally suitable for fresh, crisping and chip markets. Furthermore, because of its production window and the predominance of double cropping sequence varieties that have short dormancy have been favoured.

The program to date has seen the development of several important varieties the most notable of which, from a Queensland perspective, have been Snow Gem and Red la Soda. However, although exceptional as a fresh washed or brushed line Snowgem does not fry very well and skin bloom is not always retained. A further variety developed under the scheme was Winlock, which although being very high yielding and tolerant of adverse conditions did not have good presentation in the market place and was highly sensitive to the internal disorder Brown Fleck.

The present document reports research on potato varietal evaluation in Queensland for the period from July 1996 to June 2000.

4. Materials and Methods

The breeding material in this project has been either bred or introduced under the National Potato Improvement and Evaluation Scheme. Breeding of new lines was conducted at the Agriculture Victoria Toolangi research station by potato geneticist Dr Roger Kirkham. Each of these new lines is grown from true seed and after 2 field generations clones were forwarded to Queensland DPI, Gatton for evaluation under Queensland conditions.

Three tubers of each clone were received (about May to June), planted in middle to late June and grown to maturity. The three clones were planted at a spacing of about 28 cm. Clones were successively planted in the row with every fifth plot being planted to Sebago. At maturity, generally in early November, clones were harvested, gathered together and visually evaluated against Sebago, which is still the current industry standard for the fresh market. The main criteria for evaluation were yield, shape, consistency in size and skin colour and skin presentation. No clones were received in year 1998-1999.

With the exception of clonal material used in the final year of the project seed increasing was conducted at the Acacia Plateau in northern NSW as per Jackson et al. 1996. In the final year of the project (1999-2000) sufficient seed of each clone was received directly from Agriculture Victoria, Toolangi. Table1 highlights the number each clone received for initial evaluation and subsequent number of clones evaluated after initial inception into the program.

Table1 Number of clones evaluated over seasons within the Queensland potato cultivar evaluation program 1996-2000.

Clone series (e.g. 90-3-4)	Initial No. of clones received for assessment	Year of replicated evaluation			
		1996/97	1997/9	1998/99	1999/00
90-x-x	430	24	13	9	0
91-x-x	88	27	7	5	0
92-x-x	171	17	17	17	4
93-x-x	117		15	13	5
94-x-x	92			7	4
95-x-x	168			Not received	Not received
96-x-x	104				27

Stage I and II Evaluations for Spring and Autumn crops from 1996 up to and including Spring 1998

In the years 1996/97 and 1997/98 trials were conducted as randomised block design with varieties replicated in 2 or 3 blocks. Individual plots were about 5.5 ± 0.1 m long giving an average within row plant spacing of 27.5 cm. The inter-row spacing was 0.75 m. The spacing between plots within a row was 5 m. Coloured marker plants variety Toolangi Delight were planted at each end of plots to delineate their start and finish and prevent mixing of varieties at harvest.

Seed potato for the spring crops was planted as cut seed whilst for the autumn crop whole set seed was planted. Seed was treated with Tato Dust®. At planting 800 kg/ha of a 13.2N 2.2P 13.3 K and 18.8 S general fertiliser was applied banded below the seed piece. At 3-4 weeks post-emergence 100 kg/ha of N as urea was broadcast and the crop hilled. Sencor® (active ingredient Metribuzin) was applied at 500 g/ha was applied at the same time. Pest and disease control was conducted as necessary.

From 3 weeks after emergence irrigation was applied at weekly intervals using solid set spray lines unless sufficient rainfall fell. Prior to this hand shift spray lines were used to irrigate as required. Weekly irrigations ranged between 25 and 35 mm depending on the amount of pan evaporation.

Stage I and II Evaluations from autumn 1999 up to and including autumn 2000.

Trials were conducted as randomised block design with varieties replicated in 3 blocks. Individual plots were about 5.5 ± 0.1 m long giving an average within row plant spacing of 27.5 cm. The inter-row spacing was 0.75 m. The spacing between plots within a row was 1 m. Coloured marker plants variety Toolangi Delight were planted at each end of plots to delineate their start and finish and prevent mixing of varieties at harvest.

Seed potato for the spring crops was planted as cut seed whilst for the autumn crop whole set seed was planted. Seed was treated with Tato Dust®. At planting 600 kg/ha of a 13.2N 2.2P 13.3 K and 18.8 S general fertiliser was applied banded below the seed piece. At 3-4 weeks post-emergence 150 kg/ha of prilled potassium nitrate was broadcast and the crop hilled. Sencor® (active ingredient Metribuzin) was applied at 500 g/ha was applied at the same time. Pest and disease control was conducted as necessary. Three applications each of foliar zinc (Zinctrac® @ 1 L per ha) and boron (Bortrac® @ 2 L per ha) were applied.

Up until 3 weeks after emergence handshift spraylines were used to irrigate as required. After this irrigation was applied through solid set spraylines as necessary using tensiometer readings as the basis for determining irrigation timing.

The time to 50% emergence was recorded and varieties were rated for maturity. At harvest tuber yield was determined in the grades <80 g, 80-200, 200-350 g, 350-450g and >450 g. Tuber characteristics including shape, colour, eye depth, skin brightness cooking quality and percentage dry matter were determined. Incidence of physiological disorders including cracks, hollow heart, brown fleck and secondary growth was recorded. Crisp quality and dry matters were determined for each variety. The varieties Sebago, Winlock, Pontiac and Atlantic were grown in all trials as standards.

Stage III

A reduction in budget allocation in the project precluded us doing Stage III testing in the final 2 years of the project.

5. Results and Discussion

Tables 2-7 present the number 1 grade tuber yield across varieties for the duration of their time in the evaluation program.

Table 2. Comparison of No 1 grade yield (80-350 g tubers) in tonnes ha⁻¹ for the 1990 series of clones over various seasons.

Entry	Yield No. 1 grade (tonnes ha ⁻¹)					
	1996 Spring	1997 Winter	1997 Spring	1998 Winter	1998 Spring	1999 Winter
Atlantic	41.6	26.9	33.65	4.6	13.5	31.3
Pontiac	49.1	33.9	28.75	6.8	18.5	34.3
Sebago	39.5	22.0	34.40	4.9	10.0	36.7
Winlock	46.9	34.5	33.33	12.8	22.6	27.6
90-105-31	37.4	30.3				
90-109-23	20.1	3.3				
90-109-54	39.3	24.0	25.30	11.6	19.8	29.2
90-109-59	33.4	19.5	24.06	6.5		
90-116-2	14.1	17.9				
90-121-18	31.0	26.3				
90-125-3	33.3	17.5	27.85	7.0		
90-128-12	41.3	15.0	30.37	3.6		
90-144-1	29.9	9.0				
90-145-8	1.6	0.9				
90-17-25	33.3	25.1				
90-20-5	41.9	27.6	28.18	12.4	21.9	31.5
90-2-10	27.7	20.9				
90-29-6	28.4	25.9	28.40	10.9		
90-3-4	37.3	30.0	28.77	5.3		
90-40-11	39.6	27.5	27.50	6.5	22.6	31.07
90-48-15	39.3	42.1	31.10	4.5	19.6	35.8
90-70-3	22.8	22.5				
90-76-6	37.7	14.6	32.60	10.1		
90-77-4	43.7	17.1	30.35	7.2	14.3	25.9
90-7-9	47.8	46.8	30.87	4.9	17.4	41.0
90-83-39	37.0	22.0	25.82	5.2	15.9	
90-86-14	15.1	9.4			27.8	
90-90-9	31.7	17.7			13.1	

Table 3. Comparison of No 1 grade yield (80-350 g tubers) in tonnes ha⁻¹ for the 1991 series of clones over various seasons.

Entry	Yield No. 1 grade (tonnes ha ⁻¹)					
	1996 Spring	1997 Winter	1997 Spring	1998 Winter	1998 Spring	1999 Winter
Atlantic	41.6	26.9	33.6	4.6	13.5	31.3
Pontiac	49.1	33.9	28.7	6.8	18.5	34.3
Sebago	39.5	22.0	34.4	4.9	10.0	36.7
Winlock	46.9	34.5	33.3	12.8	22.6	27.6
91-1-5	28.2	15.4				
91-19-4	14.9	16.2				
91-21-2	10.5	9.5				
91-21-28	4.8	8.4				
91-22-2	41.2	30.4	27.5	6.1	15.1	26.7
91-35-34	20.8	11.5				
91-55-12	36.6	24.3	21.3	10.7		
91-58-5	33.1	16.6				
91-58-7	13.2	6.1				
91-60-1	30.3	12.6				
91-64-3	10.4	2.5				
91-68-1	23.7	13.6				
91-71-2	42.2	31.2	22.4	7.2	10.3	27.5
91-92-6	43.8	32.8	24.1	5.3	18.1	29.4
91-96-1	45.9	21.4	31.0	4.2	28.1	37.0
91-96-7	21.0	10.4				
91-106-1	4.5	3.4				
91-110-2	20.9	31.5				
91-110-6	30.2	7.0				
91-124-6	28.3	21.6				
91-138-7	15.7	6.4				
91-148-3	5.7	9.9				
91-155-1	24.5	11.2				
91-156-2	33.6	28.7	22.8	7.5		
91-164-2	43.3	29.1	24.6	5.0	9.0	24.3
91-164-10	6.8	15.6				
91-165-6	3.3	16.1				

Table 4. Comparison of No 1 grade yield (80-350 g tubers) in tonnes ha⁻¹ for the 1992 series of clones over various seasons.

Entry	Yield No. 1 grade (tonnes ha ⁻¹)							
	1996 Spring	1997 Winter	1997 Spring	1998 Winter	1998 Spring	1999 Winter	1999 Spring	2000 Winter
Atlantic	41.6	26.9	29.0	8.2	12.4	37.5	36.0	
Pontiac	49.1	33.9	38.4	13.3	15.0	38.7	42.0	
Sebago	39.5	24.7	37.5	7.5	20.9	40.8	38.9	
Winlock	46.9	34.5	29.4	17.5			38.0	
92-5-4	35.1	21.1	26.9	9.8	9.8	31.3		
92-6-8	40.2	32.2	31.0	9.1	14.2	21.1		
92-11-1	36.6	16.8	36.8	8.5	17.7	23.4	26.1	
92-11-1Vic(1999 only)							38.2	
92-13-2	45.7	29.0	35.8	10.8	11.9	33.1		
92-13-11	42.3	29.2	27.3	16.5	18.8	26.5		
92-19-6	55.4	41.6	31.6	14.2	28.7	50.1	53.1	42.9
92-22-5	42.8	23.9	34.2	13.0	20.3	28.6	27.9	
92-40-5	34.3	24.0	29.6	16.4	20.9	26.1	23.2	
92-61-10	27.3	37.6	29.5	11.2	11.7	29.6		
92-68-9	37.7	19.9	33.2	8.9	12.9	31.3		
92-96-3	49.2	26.2	34.5	18.0	24.3	31.9		
92-99-4	45.2	20.8	25.6	13.4	16.3	22.5		
92-102-12	47.1	14.2	29.9	9.5	9.8	22.2		
92-102-13	36.2	23.7	27.6	7.2	8.4	25.5	31.6	
92-113-9	49.2	35.5	20.1	3.2	5.1	16.7		
92-117-6	43.7	28.4	8.6	4.7	1.3	2.0		
92-118-2	24.9	36.0	31.4	10.2	15.2	31.7		

Table 5. Comparison of No 1 grade yield (80-350 g tubers) in tonnes ha⁻¹ for the 1993 series of clones over various seasons.

Entry	Yield No. 1 grade (tonnes ha ⁻¹)				
	1997 Spring	1998 Winter	1998 Spring	1999 Winter	1999 Spring
Atlantic	29.0	8.2	12.4	37.5	36.0
Pontiac	38.4	13.3	15.0	38.7	42.0
Sebago	37.5	7.5	20.9	40.8	38.9
Winlock	29.4	17.5			38.0
93-5-5	33.8	12.2	6.7	13.3	
93-5-9	37.0	14.3	1.7	26.9	
93-14-4	27.5	12.3	9.3	34.0	0.00
93-17-8	24.2	11.9	1.5	37.6	
93-17-16	41.0	16.2	22.7	31.6	4.5
93-18-17	29.8	11.6			
93-20-10	31.0	15.4	14.8	36.0	
93-21-5	31.7	11.1	21.3	35.1	
93-36-1	13.9	15.7	6.01	35.4	4.3
93-38-1	23.1	11.6	4.7	22.7	
93-38-42	31.5	8.8	14.9	24.7	4.4
93-44-3	30.9	2.4	14.7	29.6	
93-87-1	28.1	10.5	20.9	26.7	3.3
93-121-2	29.9	8.1			
93-124-10	26.1	12.3	21.4	29.4	

Table 6. Comparison of No 1 grade yield (80-350 g tubers) in tonnes ha⁻¹ for the 1994 series of clones over various seasons.

Entry	Yield No. 1 Grade (tonnes ha ⁻¹)			
	1998 Spring	1999 Winter	1999 Spring	2000 Winter
Atlantic	12.4	37.5	36.0	
Pontiac	15.0	38.7	42.0	
Sebago	20.9	40.8	38.9	
Winlock			38.0	
94-13-2	19.0	33.0	27.3	
94-26-2	23.2			
94-28-1	19.8	33.0	32.9	
94-28-1 Vic			33.1	
94-94/95-9	23.9	27.3	41.1	25.6
94-97-2	25.8	39.4	51.0	38.4
94-103-11	11.7	37.0		
94-111-23	16.6	29.3		

Table 7. Comparison of No 1 grade yield (80-350 g tubers) in tonnes ha⁻¹ for the 1996 series of clones over various seasons.

Entry	Yield No 1 grade (tonnes ha ⁻¹)	
	Spring 1999	Winter 2000
Atlantic	36.0	37.1
Crispa	24.7	31.0
Dawmor	33.7	31.5
Pontiac	42.0	34.6
Ruby Lou	41.3	31.7
Sebago	38.9	31.7
Winlock	38.0	26.4
106-32-40	40.2	
96-101-2	36.7	
96-102-4	34.2	
96-107-3	39.3	34.8
96-135-3	25.9	
96-24-2	39.1	29.1
96-24-5	37.7	
96-25-1	39.1	34.3
96-26-6	37.5	
96-27-5	40.5	32.5
96-27-6	36.7	
96-28-5	17.0	
96-29-21	43.4	
96-29-26	26.5	
96-29-5	42.0	25.3
96-32-15	48.4	31.2
96-32-2	42.3	28.5
96-32-24	41.8	31.2
96-32-29	41.5	32.6
96-32-43	39.1	36.8
96-32-8	37.9	31.3
96-37-1	41.9	35.0
96-59-6	30.0	
96-70-6	40.1	29.9
96-74-1	38.3	
96-87-10	37.9	
96-87-2	44.1	31.4
96-92-7	28.9	

5.1 Season analysis

The seasons for Spring 96 and 97 and Autumn 1997 were very good, minimal incidence of westerly winds was recorded, temperatures were mild and generally good rainfall was recorded. For the Autumn 1998 crop conditions at planting were harsh. The minimum soil temperatures recorded for February and March were in the high 20's. This severely impacted on the general health of the crop and subsequent yields were low. This was a common feature in all crops grown in the district. Considerable westerly influences reduced the yield of the Spring 1998 crop. The Autumn and Spring crops of 1999 were grown under favourable conditions and for the Spring crop minimal westerly wind influences were recorded. In general, yields in this year were high.

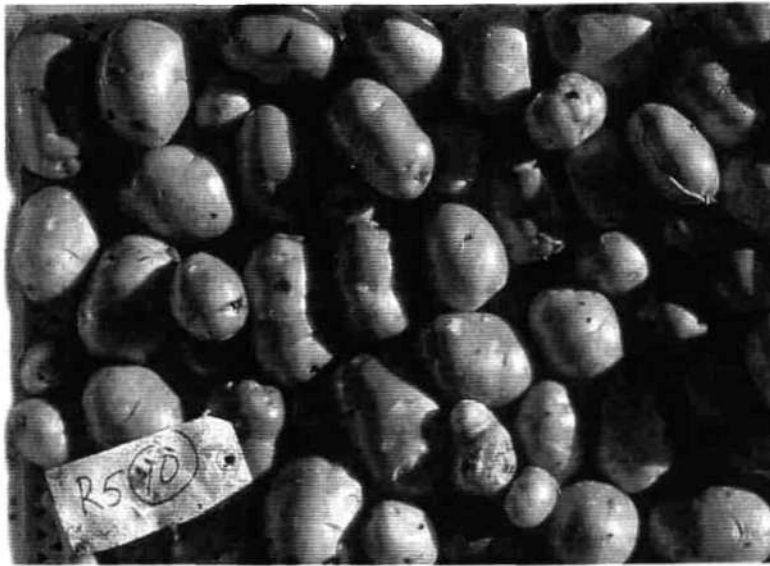
The increased yield in the Autumn 1999 over the Spring 1998 was unusual in that the Spring crops generally outyield the following Autumn crops. This is particularly so as the Spring crop is planted using certified seed, however the subsequent Autumn crop is planted using chats/seed from this Spring crop. The marked yield increase in the Autumn 1999 (and Spring 1999) over the Spring 1998 crop may in part be due to altered management practices of, increased irrigation application, altered nutritional management and also seasonal affects.

5.2 Washing lines

Several lines have shown great potential as washed white or red skin varieties.

Ruby Lou

This variety has been trialed as 90-40-1 and exhibits very good characteristics. When grown in Queensland it exhibits a rich pink coloured waxy skin similar to Desire but having white flesh with good even medium size. This is in contrast with other southern regions where the variety produces a deeper red skin. The varieties short dormancy will make it particularly good for Queensland's early production and dual cropping sequences.



It is a good yielding variety with yield of No 1 grade tubers being between 30-40 tonne ha⁻¹ and has yield comparable to that of Red la Soda and Sebago. The parentage of Ruby Lou is Foxtan x 69-32T-4.

Shine (90-105-14)

Shine has been trialed in Queensland for only one season, Spring 1999, and has demonstrated good yield potential (33.1 tonne ha⁻¹ No 1 grade) despite the fact that the seed was on the young side. As the variety is to be released shortly this variety needs further evaluation. Similarly its sister line of Wintergem (90-105-16) warrants evaluation. The parentage of Shine is Wauseon x Wilwash. It has short dormancy with early bulking and early maturity (Kirkham et al 1998).

White Rhino (86-31-5)

This variety shows excellent yield potential in northern Queensland but is only suitable for brushed trade and potentially export. Its addition as a parent line in a breeding program would be useful.

92-19-6

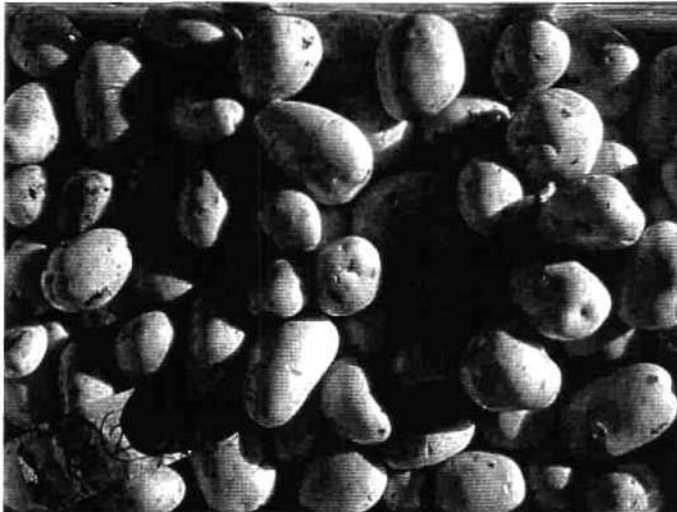
This line is a sister line to the advanced Victorian lines 92-19-4 and 92-19-10. This line has demonstrated exceptional skin presentation having a bright shiny appearance and few lenticels. The washing potential for this line is good and this would be expected given its parentage (Crystal x Wilwash). This line also appears to have virus tolerance or resistance.

In the most recent Autumn crop this line has outyielded all other commercial and breeder lines despite the presence of visual virus symptoms. It also outperformed its sister lines when a direct comparison was made in Spring 1999. Lines 92-19-4 and 92-19-10 yielded 28.8 and 24.4 tonnes per ha respectively compared with 92-19-6 which yielded 51.3 tonnes per ha. The seed of the sister lines appeared to be a little

young and this may have influenced final yield but it is unlikely it would account for such a large difference in yield. The sister line 92-19-4 has performed exceptionally well on the Atherton Tableland yielding 61.3 tonne ha⁻¹ in 1997 (Kirkham et al 1998.)

In the first 2 seasons trials 92-19-6 outperformed all other lines for the same year yielding 55.4 tonne per ha in the first spring season it was grown. Particular attention to nutrition and irrigation has meant this line has yielded exceptionally well in the Autumn 1999 and Spring and Autumn crops for 1999/2000 as well. The high yield capacity in both winter and spring cropping is probably related to the openness of its canopy structure which when grown under short winter days enables maximum solar radiation absorption. The line also has a good strong stem and persists for a longer growth period than other lines.

A major part of its ability for high yield is related to its high tuber setting capacity. Averaged across 5 trials the tuber set for 92-19-6 is 7.7 tubers per plant in a range from 5.3 to 9.8.



A major detraction of this line, when grown as a spring crop, is its high susceptibility to brown fleck. As such this line may in the future play an important role in the winter cropping sequence when it is not susceptible to brown fleck. This line certainly would play an important role as a breeding line should future Queensland variety evaluation be conducted particularly as its parentage is of a washing background and its apparent resistance to virus.

93-14-4 and 93-36-1 and 93-124-10

In early trialing these lines were grown under a series of harsh seasons where they yielded well. The presentation of these lines has been good having white waxy skins and good vigorous bush growth. The parentage of these lines would reinforce their suitability for washing. Unfortunately these lines in latter trialing have contracted virus and this dramatically reduced yield. These lines could potentially be good but need to be cleaned of virus and re-evaluated. The parentage of these lines would indicate their suitability for washing and potential for growing in Queensland. Line

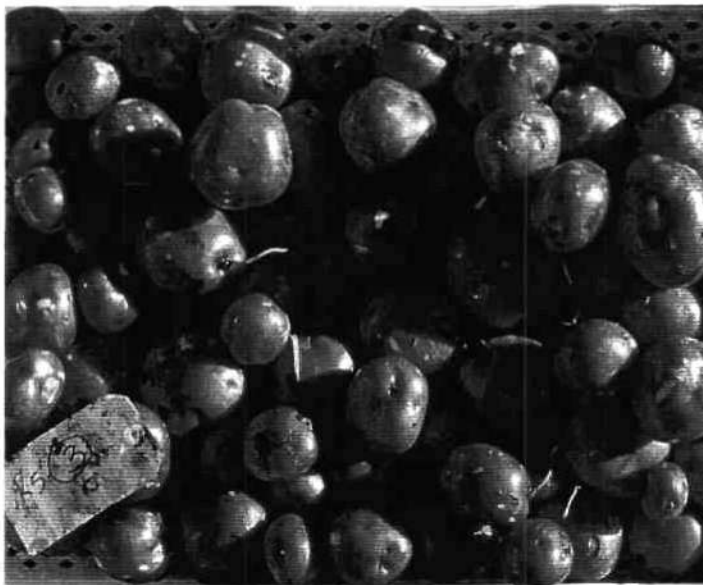
93-14-4 is Crystal x Exodus, 93-36-1 is Evans x Norgleam and 93-124-10 is 88-55-18 x Coliban.

94-97-2

This line has exhibited high yields across all seasons trialed.

96-29-5

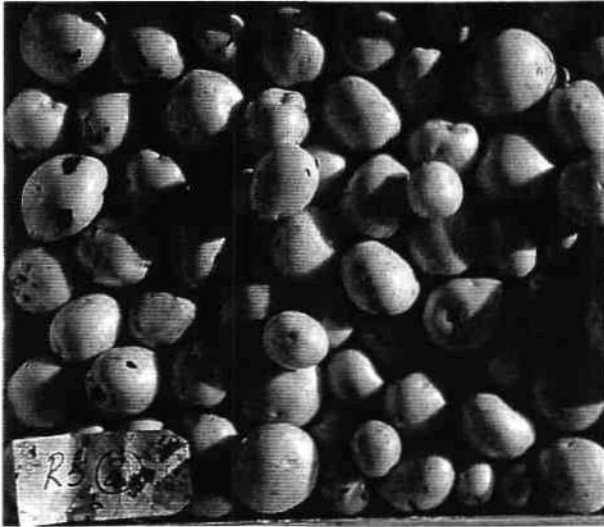
This line has only been trialed twice, in the Spring of 1999 and Autumn of 2000. It has yielded exceptionally well in both trials, 42.0 and 25.3 tonnes per ha respectively. The colour of skin is a deep/bold red and size is medium to large. This line is likely to fit in well with spring production. The parentage is Crystal x Redsen.



96-32-15 and 96-32-8

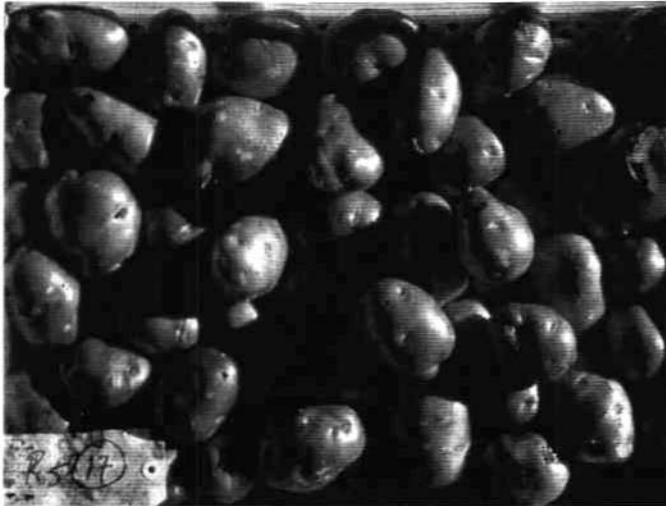
These lines have been trialed twice, the Spring of 1999 and Autumn of 2000. Both have yielded exceptionally well in these trials with 96-32-15 being the superior line. Line 96-32-15 yielded 48.4 and 31.2 tonnes per ha for the Spring 1999 and Winter 2000 crops respectively. This line has good even size, tubers have a smooth white waxy skin, shallow eyes and even oval shape, although they can be slightly tapered on the basal part of the tuber. Line 96-32-15 showed tremendous potential for setting tubers and the tuber no. per plant was 6.6 and 5.8 for the Spring 1999 and Winter 2000 crops respectively. This is likely to be a big part of its ability to yield well.

The parentage is Crystal x Wilwash making it suitable for washing trade. This parentage is the same as that of 92-19-6, 92-19-10 and 92-19-4; the resemblance to these varieties is obvious.



96-37-1

This variety is unusual in that it has a soft pastel mauve coloured skin with medium to long tubers of even shape and has high yielding potential. Yields in the Spring 1999 and Winter 2000 were 41.9 and 35.0 tonnes per ha. The presentation is very good with the skin being smooth and shiny. This line has the potential to fill a niche market. The parentage of this line is Foxtan x 69-32T-4 which is the same as that for Ruby Lou.



96-87-2

This red skin variety has exceptional deep red colour with smooth waxy skin. It has yielded very well in the Spring. Yield as a winter crop was low and it was somewhat prone to cracking. This cracking may have been due to unseasonal cold conditions at tuber filling. The parentage is Snowgem x Redsen; Snowgem has been an exceptional white skinned washing variety for spring production in Queensland.

96-74-5

This variety has deep purple glistening skin and white flesh. The plant is extremely vigorous and persists well after other lines have senesced. The yield potential is thus very high and it may have a role in either breeding or gourmet markets. This has only been used as a marker plant but yield of the sister line 96-74-1 was 38.3 tonne per ha in the Spring 1999 crop. This line warrants further evaluation.

5.3 Virus infection

Problems with virus infection in seed have been noted in the past. Seed increasing was largely conducted on the Acacia Plateau near Killarney. This region is a large ware production area and often two off certified seed can be used in the district. The first clear cut field observation of virus infection was in Spring 1999 in the lines 93-14-4, 93-17-16, 93-36-1 and 93-124-10. These varieties in Autumn 1999 had performed exceptionally well.

Notwithstanding, some benefit has been derived; the variety 92-19-6 has performed exceptionally well over all seasons to the point where in the 1999 Spring crop yielded 53.06 tonne per ha of no 1 grade tubers despite the presence of virus symptoms. It is tentatively suggested this line may have some virus resistance or tolerance. Furthermore, in the Autumn 2000 crop this line exhibited visual symptoms of virus infection but still outyielded all other varieties.

In the Spring 1999 crop a direct comparison of 2 available certified seed lines from Toolangi and existing seed lines from Killarney were made (Lines 92-11-1 and 94-28-1). The Victorian seed for 92-11-1 yielded 38.23 tonne/ha whilst the crop from Killarney seed yielded only 26.14 tonne/ha. However, the Victorian seed for 94-28-1 yielded 33.11 tonne/ha whilst the crop from Killarney seed was similar yielding 32.89 tonne/ha. A general observation of varieties has been that in the earlier stages of evaluation they have tended to yield better than in the later stages.

Table 8. Yield of various weight grades, ranking, Tuber set per plant Quality aspects for potato lines Junior Fresh A Spring 1996 harvest.

Entry	Yield. Tonnes Per Hectare						Rank By No.1 Grade	Tuber No. Per Plant	Quality	
	Chats 0-80g	Small 80- 200g	Medium 200-350g	Large 350-450g	Over Size >450g	No.1 Grade 80- 350g			% Dry Matter	Fry * Colour
Atlantic	1.7	17.6	24.0	4.3	0.3	41.6	6	6.4	22.6	2.2
Pontiac	4.0	21.9	27.2	9.7	3.6	49.1	1	7.5	16.5	5.0
Sebago	4.1	24.5	15.0	0.8	0.0	39.5	9	6.9	17.8	2.7
Winlock	5.4	22.6	24.3	9.6	8.7	46.9	3	8.9	19.5	3.3
90-2-10	3.1	15.4	12.3	2.6	2.2	27.7	23	5.0	21.0	2.3
90-3-4	4.2	13.9	23.4	4.5	1.7	37.3	14	6.4	19.7	1.8
90-7-9	5.6	25.1	22.7	2.0	0.6	47.8	2	8.2	20.4	2.5
90-17-25	3.4	14.4	18.9	9.5	2.5	33.3	17	5.9	21.6	2.7
90-20-5	4.9	22.8	19.1	3.4	0.6	41.9	5	7.3	19.8	3.8
90-29-6	2.8	11.4	17.0	6.5	0.7	28.4	22	4.6	20.4	3.3
90-40-11	2.7	18.6	21.0	2.5	1.0	39.6	8	5.8	19.3	2.7
90-48-15	5.5	24.5	14.8	1.5	1.1	39.3	11	8.1	18.9	3.3
90-70-3	4.9	14.7	8.1	0.7	0.0	22.8	24	5.3	20.5	2.0
90-76-6	3.5	12.9	24.8	6.2	2.7	37.7	12	6.0	18.5	3.0
90-77-4	5.8	19.4	24.3	5.3	0.0	43.7	4	7.9	17.8	5.7
90-83-39	6.9	28.2	8.8	1.1	0.0	37.0	15	8.9	20.6	1.0
90-86-14	3.6	10.7	4.4	0.3	0.0	15.1	26	3.5	21.5	2.0
90-90-9	7.3	29.0	2.7	0.0	0.0	31.7	19	8.1	22.1	2.7
90-105-31	5.3	18.4	19.1	5.6	1.7	37.4	13	8.0	17.5	3.2
90-109-23	5.1	11.0	9.1	3.1	0.7	20.1	25	5.1	19.6	3.3
90-109-54	5.0	20.5	18.8	3.6	0.6	39.3	10	7.1	19.6	2.2
90-109-59	4.3	18.9	14.5	1.8	0.6	33.4	16	6.5	19.6	3.0
90-116-2	3.3	11.6	3.5	0.3	0.0	14.1	27	3.9	20.0	3.0
90-121-18	2.9	14.0	17.0	4.2	0.4	31.0	20	7.9	23.4	3.0
90-125-3	3.7	19.9	13.3	1.5	0.3	33.3	18	6.7	21.2	3.8
90-128-12	6.8	23.0	18.3	3.6	0.7	41.3	7	8.2	18.6	3.8
90-144-1	5.5	18.0	11.9	0.5	0.0	29.9	21	6.3	17.9	3.8
90-145-8	3.5	1.6	0.0	0.0	0.0	1.6	28	2.1	22.3	2.8
LSD P=0.05	1.6	6.5	6.8	3.1	1.8	7.6		1.5	2.4	1.6
LSD P=0.01	2.1	8.8	9.1	4.2	2.5	10.2		2.1	3.3	2.2

* Samples assessed visually , scale 1-6, 3 = borderline, > 3 = too dark

Table 9. Yield of various weight grades, ranking, Tuber set per plant Quality aspects for potato lines Junior Fresh B Spring 1996 harvest.

Entry	Yield, Tonnes Per Hectare						Rank By No.1 Grade	Tuber No. Per Plant	Quality	
	Chats 0-80g	Small 80- 200g	Medium 200-350g	Large 350-450g	Over Size >450g	No.1 Grade 80- 350g			% Dry Matter	Fry * Colour
Atlantic	1.7	17.6	24.0	4.3	0.3	41.6	7	6.4	22.6	2.2
Pontiac	4.0	21.9	27.2	9.7	3.6	49.1	1	7.5	16.5	5.0
Sebago	4.1	24.5	15.0	0.8	0.0	39.5	9	6.9	17.8	2.7
Winlock	5.4	22.6	24.3	9.6	8.7	46.9	2	8.9	19.5	3.7
91-1-5	8.5	20.6	7.6	0.0	0.0	28.2	16	8.0	20.8	2.2
91-19-4	1.0	11.3	3.7	0.3	0.0	14.9	23	2.9	18.4	1.8
91-21-2	4.6	9.7	0.8	0.2	0.6	10.5	25	3.7	19.9	1.8
91-21-28	2.5	4.3	0.5	0.0	0.0	4.8	29	2.8	19.3	3.3
91-22-2	3.1	17.8	23.4	11.1	0.7	41.2	8	6.3	17.6	5.0
91-35-34	5.2	13.6	7.2	0.0	1.0	20.8	21	5.1	21.3	1.8
91-55-12	1.4	14.8	21.7	2.0	0.4	36.6	10	4.7	23.8	2.0
91-58-5	5.3	17.8	15.4	1.6	0.7	33.1	12	7.9	20.0	3.0
91-58-7	6.7	7.8	5.5	0.5	0.0	13.2	24	5.2	19.6	3.5
91-60-1	6.4	21.3	9.0	0.0	0.0	30.3	13	7.8	19.8	3.2
91-64-3	7.7	9.4	1.0	0.0	0.0	10.4	26	4.7	20.1	2.8
91-68-1	6.3	20.4	3.2	0.0	0.0	23.7	18	7.0	21.2	2.3
91-71-2	4.4	25.9	16.4	0.5	0.0	42.2	6	7.1	23.4	2.0
91-92-6	4.0	22.4	21.4	5.7	4.7	43.8	4	8.2	19.7	1.5
91-96-1	2.6	17.3	28.6	7.3	3.0	45.9	3	6.5	22.1	2.0
91-96-7	5.9	16.7	4.3	0.0	0.0	21.0	19	5.4	21.5	3.2
91-106-1	2.9	4.4	0.2	0.0	0.0	4.5	30	3.3	19.3	1.3
91-110-2	1.8	13.3	7.6	0.5	0.0	20.9	20	3.7	18.4	4.7
91-110-6	5.8	19.8	10.5	1.3	0.0	30.2	14	6.2	19.1	3.2
91-124-6	3.5	12.9	15.5	4.9	1.1	28.3	15	5.2	17.9	5.2
91-138-7	3.3	13.0	2.7	0.0	0.0	15.7	22	3.7	22.6	3.3
91-148-3	3.3	4.8	0.9	0.0	0.0	5.7	28	2.8	16.4	4.0
91-155-1	6.7	18.0	6.5	0.2	0.0	24.5	17	6.6	22.6	2.0
91-156-2	3.8	24.4	9.2	0.0	0.0	33.6	11	5.8	24.3	2.5
91-164-2	6.4	30.6	12.8	0.6	0.0	43.3	5	8.7	21.7	3.7
91-164-10	3.7	6.3	0.5	0.0	0.0	6.8	27	2.9	23.3	2.5
91-165-6	6.1	3.2	0.1	0.0	0.0	3.3	31	3.2	22.2	2.3
LSD P=0.05	1.3	5.3	5.3	3.0	1.2	6.0		1.3	2.1	1.2
LSD P=0.01	1.8	7.1	7.1	4.1	1.7	8.0		1.7	2.8	1.6

• Samples assessed visually, scale 1-6, 3 = borderline, > 3 = too dark

Table 10. Yield of various weight grades, ranking, Tuber set per plant Quality aspects for potato lines for Junior Fresh C Spring 1996 harvest.

Entry	Yield. Tonnes Per Hectare						Rank By No.1 Grade	Tuber No. Per Plant	Quality	
	Chats	Small	Medium	Large	Over Size	No.1 Grade			% Dry Matter	Fry * Colour
	0-80g	80- 200g	200-350g	350-450g	>450g	80- 350g				
Atlantic	1.7	17.6	24.0	4.3	0.3	41.6	14	6.9	22.6	2.2
Pontiac	4.0	21.9	27.2	9.7	3.6	49.1	4	7.5	16.5	5.0
Sebago	4.1	24.5	15.0	0.8	0.0	39.5	17	6.9	17.8	2.8
Winlock	5.4	22.6	24.3	9.6	8.7	46.9	6	8.9	19.5	3.5
92-5-4	2.2	16.5	18.5	7.7	1.9	35.1	24	5.8	18.7	3.0
92-6-8	3.3	17.9	22.3	4.2	1.6	40.2	16	7.2	20.9	1.3
92-11-1	3.5	17.1	19.5	4.9	0.4	36.6	22	5.7	17.5	3.5
92-13-2	4.8	25.3	20.4	2.9	1.0	45.7	7	7.9	19.5	2.0
92-13-11	3.6	22.8	19.6	0.8	0.0	42.3	13	6.3	18.8	2.5
92-19-6	4.0	27.4	28.0	5.3	0.0	55.4	1	9.0	19.7	3.0
92-22-5	4.8	19.6	23.2	4.6	2.7	42.8	12	6.8	19.6	3.3
92-40-5	2.7	18.4	15.9	1.1	0.3	34.3	25	7.2	19.5	4.0
92-61-10	2.6	13.5	13.8	2.8	1.9	27.3	26	5.2	18.9	4.0
92-68-9	3.1	17.2	20.5	3.5	0.3	37.7	21	6.3	16.1	5.0
92-96-3	3.2	15.7	33.5	8.9	2.5	49.2	2	7.1	18.9	3.8
92-99-4	3.5	26.0	19.2	0.8	0.0	45.2	9	7.3	21.2	2.3
92-102-12	4.9	24.6	22.5	4.3	3.3	47.1	5	8.0	20.5	1.3
92-102-13	5.0	24.2	12.0	0.2	0.0	36.2	23	6.9	20.9	1.5
92-113-9	7.1	30.4	18.8	1.0	0.0	49.2	3	9.9	22.6	3.0
92-117-6	9.3	34.2	9.4	0.2	0.0	43.7	11	10.3	22.7	2.2
92-118-2	1.8	10.3	14.6	4.1	2.3	24.9	27	4.2	20.3	1.8
LSD P=0.05	2.3	8.5	9.6	4.1	1.7	11.6		1.9	2.3	1.3
LSD P=0.01	3.1	11.5	12.9	5.6	2.3	15.7		2.5	3.2	1.7

Samples assessed visually , scale 1- 6, 3 = borderline, > 3 = too dark

Table 11. Yield of various weight grades, ranking, Tuber set per plant Quality aspects for potato lines Senior Fresh Spring 1996 harvest.

Entry	Yield. Tonnes Per Hectare						Rank by No.1 Grade	Tuber No. Per Plant	Quality	
	Chats	Small	Medium	Large	Over Size	No.1 Grade			% Dry Matter	Fry * Colour
	0-80g	80-200g	200-350g	350-450g	>450g	80- 350g				
Sebago NW	5.0	26.3	17.6	2.3	1.1	43.9	10	7.4	18.2	2.8
Pontiac	4.7	25.3	27.4	8.5	7.5	52.7	3	8.2	17.3	3.4
Red Rascal	4.3	22.9	29.2	4.0	1.7	52.1	4	8.6	19.3	3.8
Crop 8	5.7	35.7	27.2	4.7	1.2	62.9	1	10.4	18.8	2.8
Centurion	3.2	19.9	25.4	13.4	15.5	45.4	9	7.4	16.0	6.0
Dali	5.8	22.6	23.4	2.6	0.3	46.0	8	8.3	17.5	4.8
Florissant	8.8	30.1	9.1	0.8	0.0	39.1	14	8.9	22.1	3.8
Gold Star	7.0	30.8	16.5	1.1	0.0	47.3	5	8.6	21.2	1.0
Leonardo	5.3	18.3	20.7	7.6	7.4	39.0	16	7.5	19.0	3.0
Latona	4.2	16.9	24.9	9.3	5.8	41.7	13	6.3	17.5	4.0
Nicola	6.2	26.0	20.0	1.5	0.0	46.0	7	6.6	18.6	5.4
Royal Blue	4.7	30.3	16.3	1.0	0.0	46.7	6	4.9	21.0	2.0
Symphonia	2.4	11.7	26.4	10.7	6.8	38.1	17	6.0	19.8	4.6
R Z 10	4.9	23.7	18.4	2.3	0.8	42.0	12	7.1	19.9	3.4
R Z 11	6.2	32.1	11.5	0.2	0.0	43.6	11	8.4	21.8	2.6
R Z 12	6.7	30.3	8.7	0.0	0.0	39.0	15	7.9	20.2	2.6
88-85-45	5.1	18.4	11.7	6.4	2.8	30.2	18	6.1	20.2	3.0
90-10-1	5.7	31.9	20.9	2.3	1.1	52.7	2	8.1	18.9	3.4
LSD P= 0.05	1.6	8.9	7.3	5.2	3.5	9.1		1.2		
LSD P = 0.01	2.2	12.3	10.1	7.1	4.8	12.4		1.7		

* Samples assessed visually , scale 1-6, 3 = borderline, > 3 = too dark

Table 12. Yield of various weight grades, ranking, Tuber set per plant Quality aspects for potato Junior Fresh Winter 1997 harvest.

Entry	Yield. Tonnes Per Hectare						Rank By No.1 Grade	Tuber No. Per Plant	Quality	
	Chats	Small	Medium	Large	Over Size	No.1 Grade			% Dry Matter	Fry * Colour
	0-80g	80- 200g	200-350g	350-450g	>450g	80- 350g				
Atlantic	5.7	18.7	8.2	1.8	1.0	26.9	9	7.3	20.4	3.0
Pontiac	4.3	17.1	16.8	8.2	3.8	33.9	4	6.2	18.7	4.5
Sebago	5.1	18.0	4.0	0.2	0.0	22.0	15	6.4	16.6	4.0
Winlock	4.6	22.4	12.1	0.7	3.2	34.5	3	10.4	17.8	3.0
90-2-10	6.5	10.8	10.1	0.0	0.0	20.9	17	6.1	20.5	3.0
90-3-4	4.5	21.3	8.7	0.8	0.3	30.0	6	4.8	19.6	4.0
90-7-9	4.7	30.1	16.7	1.2	0.0	46.8	1	9.3	21.4	2.0
90-17-25	5.1	18.2	6.9	1.8	0.0	25.1	12	7.4	20.7	3.5
90-20-5	5.4	19.0	8.5	1.2	0.7	27.6	7	9.1	19.7	4.0
90-29-6	3.1	15.4	10.6	1.9	1.3	25.9	11	5.8	19.4	4.5
90-40-11	4.3	21.2	6.3	0.8	0.3	27.5	8	6.7	17.6	3.0
90-48-15	5.6	29.2	12.9	1.5	0.0	42.1	2	8.6	19.4	2.0
90-70-3	4.2	19.1	3.3	0.0	0.0	22.5	14	5.9	19.9	4.5
90-76-6	2.8	8.9	5.8	1.8	1.0	14.6	24	4.5	15.8	4.5
90-77-4	3.9	8.6	8.4	0.5	0.3	17.1	22	9.8	17.3	5.5
90-83-39	2.7	13.1	8.9	1.2	1.1	22.0	15	5.7	22.2	2.5
90-86-14	6.8	8.3	1.0	0.1	0.1	9.4	25	12.2	23.0	3.0
90-90-9	4.2	11.4	6.4	0.0	0.0	17.7	20	6.7	26.2	1.5
90-105-31	7.4	21.9	8.7	0.3	0.0	30.3	5	9.2	16.4	4.5
90-109-23	7.4	3.2	0.1	0.0	0.0	3.3	27	5.6	15.6	5.5
90-109-54	4.5	15.2	8.8	2.1	0.0	24.0	13	6.0	20.1	4.0
90-109-59	10.5	16.3	3.3	0.8	0.0	19.5	18	8.4	19.5	3.0
90-116-2	5.0	15.5	2.3	0.0	0.0	17.9	19	6.3	19.8	2.5
90-121-18	3.7	18.0	8.3	1.8	1.1	26.3	10	10.0	22.5	2.5
90-125-3	6.0	10.7	6.7	0.1	0.7	17.5	21	16.4	21.9	3.5
90-128-12	10.1	13.3	1.7	0.1	0.1	15.0	23	8.7	16.3	5.5
90-144-1	5.9	8.4	0.6	0.0	0.0	9.0	26	5.8	17.9	4.0
90-145-8	6.7	0.9	0.0	0.0	0.0	0.9	28	4.0	22.1	4.5
LSD P=0.05	2.6	6.8	9.2	2.0	ns	12.9		3.0		
LSD P=0.01	3.5	9.2	ns	2.7	ns	17.5		4.0		

* Samples assessed visually , scale 1-6, 3 = borderline, > 3 = too dark
 ns denotes not significantly different at p=0.05.

Table 13. Yield of various weight grades, ranking, Tuber set per plant Quality aspects for potato lines Junior Fresh B Winter 1997 harvest.

Entry	Yield, Tonnes Per Hectare						Rank By No.1 Grade	Tuber No. Per Plant	Quality	
	Chats 0-80g	Small 80-200g	Medium 200-350g	Large 350-450g	Over Size >450g	No.1 Grade 80-350g			% Dry Matter	Fry * Colour
Atlantic	5.7	18.7	8.2	1.8	1.0	26.9	9	7.3	20.4	3.0
Pontiac	4.3	18.0	16.8	8.2	3.8	33.9	2	6.2	18.7	4.5
Sebago	5.1	17.1	4.0	0.2	0.0	22.0	11	6.4	16.6	4.0
Winlock	4.6	22.4	12.1	0.7	3.2	34.5	1	10.4	17.8	3.0
91-1-5	6.9	12.1	3.3	0.0	0.0	15.4	18	7.6	24.7	2.5
91-19-4	4.8	15.2	1.0	0.0	0.0	16.2	15	5.8	17.8	2.0
91-21-2	7.8	9.5	0.0	0.0	0.0	9.5	25	10.0	19.6	3.5
91-21-28	4.3	8.1	0.3	0.0	0.0	8.4	26	4.2	20.1	1.5
91-22-2	5.3	25.3	5.1	0.8	0.0	30.4	6	7.7	17.6	-
91-35-34	4.5	9.3	2.2	0.4	0.0	11.5	21	7.8	18.8	2.0
91-55-12	4.2	17.7	6.6	0.2	0.0	24.3	10	10.6	24.6	1.5
91-58-5	4.0	13.2	3.5	3.2	0.3	16.6	14	8.4	23.1	2.0
91-58-7	4.2	3.7	2.4	0.2	0.3	6.1	29	4.2	20.4	2.5
91-60-1	5.3	10.8	1.8	0.0	0.0	12.6	20	8.0	19.5	3.0
91-64-3	9.6	2.5	0.0	0.0	0.0	2.5	31	5.6	18.6	2.0
91-68-1	11.3	13.0	0.6	0.0	0.0	13.6	19	7.3	20.5	2.0
91-71-2	5.2	18.9	12.3	2.0	1.4	31.2	5	7.2	19.1	3.5
91-92-6	4.9	16.3	16.4	4.8	3.9	32.8	3	7.3	20.1	2.5
91-96-1	3.4	12.0	9.4	1.0	0.4	21.4	13	7.8	22.4	2.0
91-96-7	9.0	10.0	0.4	0.0	0.0	10.4	23	7.0	20.2	3.5
91-106-1	7.6	3.4	0.0	0.0	0.0	3.4	30	7.8	22.0	1.0
91-110-2	2.6	22.2	9.3	0.0	0.3	31.5	4	6.0	21.2	3.0
91-110-6	4.1	5.4	1.6	0.0	0.0	7.0	27	4.6	20.4	2.0
91-124-4	6.2	15.9	5.8	2.2	0.0	21.6	12	6.8	19.1	5.5
91-138-7	9.8	6.4	0.0	0.0	0.0	6.4	28	9.0	20.4	3.0
91-148-3	3.2	9.2	0.7	0.0	0.0	9.9	24	11.1	15.2	3.0
91-155-1	5.0	8.8	2.4	0.0	0.0	11.2	22	5.9	20.7	2.5
91-156-2	3.0	16.8	11.9	1.8	0.8	28.7	8	6.4	25.3	2.5
91-164-2	6.0	22.3	6.8	0.5	0.0	29.1	7	9.1	19.4	3.5
91-164-10	6.6	12.7	2.9	0.0	0.0	15.6	17	7.6	20.6	3.5
91-165-6	5.1	14.2	1.9	0.0	0.0	16.1	16	5.5	22.0	2.5
LSD P=0.05	2.1	5.1	4.6	2.1	2.2	8.1		2.5		
LSD P=0.01	2.9	6.9	6.2	2.9	ns	10.9		3.4		

* Samples assessed visually , scale 1-6, 3 = borderline, > 3 = too dark
ns denotes not significantly different at p=0.05.

Table 14. Yield of various weight grades, ranking, Tuber set per plant Quality aspects for potato lines Junior Fresh C Winter 1997 harvest.

Entry	Yield. Tonnes Per Hectare						Rank By No.1 Grade	Tuber No. Per Plant	Quality	
	Chats	Small	Medium	Large	Over Size	No.1 Grade			% Dry Matter	Fry * Colour
	0-80g	80-200g	200-350g	350-450g	>450g	80- 350g				
Atlantic	5.7	18.7	8.2	1.8	1.0	26.9	11	7.3	20.4	3.0
Pontiac	4.3	17.1	16.8	8.2	3.8	33.9	6	6.2	18.7	3.5
Sebago	5.1	18.0	6.7	0.2	0.0	24.7	13	6.4	16.6	4.0
Winlock	4.6	22.4	12.1	0.7	3.2	34.5	5	10.4	17.8	3.0
92-5-4	6.4	14.8	6.3	0.8	0.7	21.1	17	7.1	19.0	4.0
92-6-8	6.3	20.4	11.8	0.2	0.0	32.2	7	7.4	18.6	3.0
92-11-1	4.6	13.6	3.2	0.8	0.3	16.8	20	5.6	20.1	4.0
92-13-2	6.2	23.0	6.0	0.0	0.0	29.0	9	7.9	22.1	2.0
92-13-11	6.1	22.8	5.4	0.3	0.3	29.2	8	9.3	21.6	2.0
92-19-6	6.5	28.4	13.1	0.3	0.0	41.6	1	9.2	19.0	3.0
92-22-5	4.1	20.6	3.4	0.5	0.0	23.9	15	6.6	20.5	3.0
92-40-5	4.4	17.0	7.0	1.3	0.7	24.0	14	17.9	21.7	2.0
92-61-10	2.6	18.0	19.6	2.3	1.6	37.6	2	6.9	20.5	3.0
92-68-9	6.7	14.1	5.8	0.5	0.0	19.9	19	7.4	14.8	5.0
92-96-3	3.6	15.3	10.9	3.1	1.4	26.2	12	7.7	18.0	4.0
92-99-4	5.3	16.4	4.4	0.5	0.0	20.8	18	7.0	19.9	3.5
92-102-12	3.6	11.2	3.0	1.0	0.3	14.2	21	6.4	21.7	3.0
92-102-13	3.3	18.3	5.4	0.5	0.0	23.7	16	5.7	19.6	2.0
92-113-9	8.6	29.0	6.5	0.0	0.0	35.5	4	8.3	21.5	3.5
92-117-6	6.4	19.5	9.0	0.2	0.0	28.4	10	8.3	21.4	4.0
92-118-2	3.4	21.6	14.4	0.8	1.4	36.0	3	6.8	18.2	3.0
LSD P= 0.05	2.2	9.0	6.8	1.4	ns	13.1		3.1		
LSD P = 0.01	3.0	ns	9.2	2.0	ns	ns		4.2		

* Samples assessed visually , scale 1-6, 3 = borderline, > 3 = too dark
 ns denotes not significantly different at p=0.05.

Table 15. Yield of various weight grades, ranking, Tuber set per plant Quality aspects for potato lines Senior Fresh Winter 1997 harvest.

Entry	Yield. Tonnes Per Hectare						Rank by No.1 Grade	Tuber No. Per Plant	Quality	
	Chats	Small	Medium	Large	Over Size	No.1 Grade			% Dry Matter	Fry * Colour
	0- 80g	80- 200g	200-350g	350-450g	>450g	80- 350g				
Sebago NW	3.3	15.6	12.9	3.0	0.4	28.5	12	5.5	18.1	2.0
Pontiac	2.8	14.8	24.9	5.4	1.9	39.8	4	7.4	18.7	5.0
Red Rascal	8.2	33.7	13.4	0.8	0.6	47.1	1	10.2	21.0	4.0
Crop *	3.5	24.0	16.6	2.8	2.7	40.7	3	7.5	18.9	4.3
Centurion	3.1	19.8	17.0	2.2	0.3	36.8	5	5.8	14.1	6.0
Dali	3.9	20.9	12.2	2.2	0.9	33.1	7	7.4	16.7	4.3
Florrisant	14.0	20.5	0.7	0.0	0.0	21.2	17	10.0	25.1	3.3
Gold Star	3.4	17.5	15.2	0.2	0.0	32.7	8	7.3	20.3	4.3
Leonardo	3.5	17.1	18.1	4.5	1.1	35.3	6	8.0	18.2	4.3
Latona	3.4	21.0	10.2	1.9	1.1	31.3	9	6.7	17.8	4.0
Nicola	7.3	19.1	3.5	0.3	0.0	22.5	15	9.0	17.2	6.0
Royal Blue	4.3	17.0	5.1	0.3	0.3	22.1	16	6.2	21.6	3.7
Symphonia	4.3	33.3	10.8	2.1	1.1	44.1	2	9.2	19.2	5.0
R Z 10	4.5	21.7	6.5	2.7	0.4	28.1	13	7.0	14.0	5.0
R Z 11	6.7	19.5	9.7	0.2	0.0	29.1	11	8.2	17.5	4.7
R Z 12	7.7	14.1	0.7	0.0	0.0	14.8	18	7.1	19.6	4.7
88-85-45	9.4	18.8	7.7	1.9	1.5	26.5	14	8.5	20.6	4.7
90-40-1	6.7	23.6	6.9	0.2	0.0	30.5	10	8.6	20.3	3.7
LSD P = 0.05	3.0	7.4	7.0	2.2	1.5	8.8		1.9		
LSD P = 0.01	4.1	10.1	9.7	3.1	2.1	12.0		2.6		

* Samples assessed visually , scale 1-6, 3 = borderline, > 3 = too dark

Table 16. Yield of various weight grades, ranking, Tuber set per plant Quality aspects for potato lines Junior Fresh Spring 1997 harvest.

Entry	Yield, Tonnes Per Hectare						Rank by No.1 Grade	Tuber No. Per Plant	Quality	
	Chats 0-80g	Small 80- 200g	Medium 200-350g	Large 350-450g	Over Size >450g	No.1 Grade 80- 350g			% Dry Matter	Fry * Colour
Atlantic	6.2	18.8	10.2	0.3	0.0	29.0	3	6.1	22.6	1.1
Pontiac	5.0	23.4	15.0	0.4	0.7	38.4	2	8.6	19.6	3.2
Sebago	4.3	27.9	9.6	0.5	0.2	37.5	24	8.0	19.2	2.0
Winlock	6.2	22.8	6.6	3.3	0.0	29.4	23	8.1	19.7	2.8
92-5-4	3.1	17.2	9.8	0.3	0.2	26.9	29	5.9	21.9	2.2
92-6-8	3.1	22.3	8.7	0.5	0.6	31.0	16	6.8	22.6	1.7
92-11-1	4.0	17.4	19.4	2.5	0.0	36.8	5	7.2	17.6	2.7
92-13-2	4.9	28.7	7.1	0.7	0.0	35.8	6	8.0	23.0	1.7
92-13-11	4.5	20.6	6.7	0.5	0.2	27.3	28	7.4	-	1.8
92-19-6	5.6	26.7	4.9	0.0	0.0	31.6	12	8.5	21.8	3.1
92-22-5	3.6	19.8	14.5	1.1	0.0	34.2	8	7.0	20.0	2.6
92-40-5	4.4	19.5	10.1	0.9	0.0	29.6	21	7.0	20.9	2.7
92-61-10	3.4	19.0	10.5	1.0	0.0	29.5	22	7.9	19.6	2.7
92-68-9	3.0	21.2	11.9	0.2	0.2	33.2	10	6.2	17.3	4.5
92-96-3	4.3	21.5	13.0	0.8	0.0	34.5	7	8.1	19.4	3.1
92-99-4	8.4	24.3	1.3	0.0	0.0	25.6	31	9.3	20.4	1.5
92-102-12	8.1	27.0	2.9	0.0	0.0	29.9	18	9.1	20.8	3.0
92-102-13	5.9	24.3	3.3	0.0	0.0	27.6	26	7.8	20.7	2.0
92-113-9	4.9	16.4	3.7	0.4	0.2	20.1	34	7.7	23.4	2.2
92-117-6	8.5	8.2	0.4	0.0	0.0	8.6	36	6.3	19.9	2.5
92-118-2	2.8	20.8	10.6	1.2	0.0	31.4	14	6.4	21.2	2.8
93-5-5	8.7	28.5	5.4	0.0	0.0	33.8	9	9.9	22.4	2.5
93-5-9	4.6	25.1	11.9	1.1	0.0	37.0	4	6.9	21.1	1.3
93-14-4	4.3	14.3	13.2	4.6	1.1	27.5	27	7.2	20.9	3.3
93-17-8	5.9	19.0	5.1	0.4	0.0	24.2	32	7.1	19.0	3.8
93-17-16	4.0	20.9	20.0	3.6	0.9	41.0	1	7.6	18.5	2.5
93-18-17	6.5	25.1	4.7	0.2	0.0	29.8	20	9.5	19.3	3.1
93-20-10	7.3	23.0	8.0	1.2	0.0	31.0	15	8.9	18.9	2.8
93-21-5	4.3	19.9	11.7	0.9	0.7	31.7	11	8.1	20.1	2.8
93-36-1	8.2	13.4	0.4	0.0	0.0	13.9	35	7.6	22.2	1.5
93-38-1	5.7	20.6	2.5	0.2	0.0	23.1	33	8.1	19.1	2.8
93-38-42	4.0	23.5	8.0	0.5	0.0	31.5	13	7.2	20.3	2.0
93-44-3	3.9	22.2	8.7	0.4	0.2	30.9	17	7.9	18.6	2.8
93-87-1	3.7	18.7	9.4	0.5	0.0	28.1	25	7.3	18.7	2.8
93-121-2	3.0	17.1	12.8	0.7	0.0	29.9	19	7.4	19.2	3.1
93-124-10	2.3	14.2	11.9	0.5	0.0	26.1	30	4.8	20.8	1.7
LSD P=0.05	2.0	5.0	4.7	1.4	0.8	6.7		1.6		
LSD P=0.01	2.7	6.6	6.2	1.8	1.1	8.9		2.1		

* Samples assessed visually , scale 1-6, 3 = borderline, > 3 = too dark

Table 17. Yield of various weight grades, ranking, Tuber set per plant Quality aspects for potato lines Senior Fresh Spring 1997 harvest.

Entry	Yield. Tonnes Per Hectare						Rank by No.1 Grade	Tuber No. Per Plant	Quality	
	Chats	Small	Medium	Large	Over Size >450g	No.1 Grade 80- 350g			% Dry Matter	Fry *
	0-80g	80- 200g	200-350g	350-450g						Colour
Atlantic	4.6	23.0	8.1	0.1	0.2	31.3	3	5.8	23.9	1.3
Pontiac	3.7	20.7	5.9	0.5	0.0	27.1	11	5.1	18.0	1.8
Sebago	3.1	19.6	12.2	0.2	0.0	32.0	1	5.1	18.9	2.8
Wimlock	4.1	22.1	8.8	1.0	0.0	31.9	2	5.7	20.8	2.5
90-109-54	3.6	16.6	6.8	0.9	0.0	24.3	18	4.6	20.7	1.0
90-109-59	4.6	13.9	8.4	0.3	0.0	22.6	21	4.6	22.6	2.0
90-125-3	6.6	21.9	3.9	0.0	0.0	25.8	14	6.6	21.8	2.6
90-128-12	6.7	24.9	3.3	0.3	0.0	28.5	9	7.0	19.2	1.0
90-20-5	2.3	17.3	8.8	0.6	0.0	26.7	13	4.2	20.8	2.8
90-29-6	3.5	17.4	8.9	1.3	0.0	27.6	10	4.4	20.8	3.5
90-3-4	3.9	18.9	7.8	0.2	0.0	26.8	12	5.2	21.2	1.5
90-40-11	2.5	19.1	6.4	0.2	0.0	25.6	16	4.3	20.7	2.6
90-48-15	4.7	21.0	7.8	0.5	0.0	29.3	6	5.9	17.7	4.0
90-76-6	4.8	22.5	7.7	1.0	0.4	31.2	4	6.0	18.2	3.3
90-77-4	4.9	22.3	5.8	0.7	0.0	28.8	8	5.9	18.6	4.6
90-7-9	5.0	21.0	7.6	1.3	0.2	29.9	5	5.9	22.2	2.6
90-83-39	3.3	17.3	6.6	0.5	0.0	24.4	17	4.8	20.7	2.0
91-156-2	2.9	17.0	4.1	0.2	0.0	21.3	22	4.0	23.8	1.6
91-164-2	4.4	18.8	3.9	0.0	0.0	22.8	20	5.0	21.4	2.2
91-22-2	7.3	21.9	3.6	0.2	0.0	25.7	15	6.9	20.4	2.3
91-55-12	5.6	16.0	3.7	0.2	0.0	19.9	24	5.0	23.7	1.8
91-71-2	6.4	16.3	4.4	0.2	0.3	20.9	23	5.7	22.0	1.5
91-92-6	5.0	18.0	4.3	0.5	0.0	22.8	19	5.1	21.4	2.0
91-96-1	3.9	21.1	7.6	0.3	0.0	29.0	7	5.3	22.6	2.2
LSD P=0.05	2.50	ns F = .08	ns F = .29	ns	ns	ns		1.61		

* Samples assessed visually , scale 1-6, 3 = borderline, > 3 = too dark
 ns denotes not significantly different at p=0.05.

Table 18. Yield of various weight grades, ranking, Tuber set per plant Quality aspects for potato lines Kairi Fresh 1997 harvest.

Entry	Yield. Tonnes Per Hectare						Rank by No.1 Grade	Tuber No. Per Plant	Quality	
	Chats	Small	Medium	Large	Over Size >450g	No.1 Grade 80- 450g			% Dry Matter	Fry *
	0-80g	80-200g	200-350g	350-450g						Colour
Atlantic	1.0	10.9	16.7	5.3	1.9	32.9	=8	4.3	24.2	1.8
Centurion	1.9	11.6	17.7	6.8	4.8	36.1	4	4.9	16.7	5.2
Clone 82	1.3	18.2	23.2	2.6	0.9	44.0	1	6.2	24.1	1.8
Dalmore	2.3	19.7	6.0	0.1	0.0	25.8	16	4.9	22.4	2.4
Florissant	2.9	10.7	3.5	0.3	0.2	14.5	27	4.5	22.2	3.0
Goldstar	0.9	11.1	6.7	12.9	0.2	30.7	10	3.9	20.0	2.2
Latona	1.6	5.2	4.4	4.0	0.5	13.6	28	3.6	17.9	5.6
Leonardo	0.6	7.4	7.7	2.1	1.0	17.2	26	3.8	17.2	3.2
New Brunswick	1.2	12.4	12.3	1.9	1.5	26.6	14	4.6	18.4	2.6
Nicola	1.8	18.2	10.6	0.4	0.0	29.2	12	4.6	18.5	4.8
Pontiac	2.1	15.1	17.8	3.7	0.6	36.6	3	5.3	19.0	5.2
Ranger Russett	2.3	15.1	3.3	0.1	0.0	18.5	25	3.9	20.2	3.0
Sebago	1.7	18.7	13.0	2.1	0.4	33.8	6	5.1	18.4	1.0
Shepody	0.6	7.7	8.3	2.8	2.2	18.8	24	2.8	21.3	3.0
Symphonia	0.4	6.0	13.5	4.0	3.0	23.5	19	4.0	19.7	3.0
Winlock	1.5	13.0	8.5	1.3	1.0	22.8	21	4.3	18.5	2.8
80-96-16	0.9	10.6	10.2	0.9	0.2	21.7	22	3.2	17.7	3.8
86-31-3	4.4	28.2	11.3	1.3	0.0	40.8	2	7.3	22.5	3.0
86-31-5	0.9	11.4	15.6	7.4	5.6	34.4	5	4.3	20.3	3.0
86-67-5	1.0	12.6	14.5	1.9	0.6	29.0	13	4.6	18.5	2.6
87-5-7	2.2	18.3	12.9	2.0	0.4	33.2	7	5.3	22.1	2.0
87-12-8	2.8	13.3	10.6	2.5	1.3	26.4	15	5.3	19.3	4.2
87-57-9	2.2	20.2	8.9	0.6	0.0	29.7	11	5.2	20.0	4.2
89-10-3	1.3	7.9	2.9	0.6	0.4	11.4	29	3.2	21.7	3.6
89-24-7	2.1	16.8	7.1	0.6	0.2	24.5	18	4.2	26.0	3.0
89-27-33	1.8	13.5	6.1	0.4	0.0	20.0	23	4.2	19.9	3.4
89-78-27	3.1	17.7	5.1	0.1	0.6	22.9	20	5.9	18.0	2.6
90-2-6	1.0	8.3	12.7	4.6	2.5	25.6	17	3.4	23.9	2.4
90-148-2	1.6	16.7	12.6	3.6	2.6	32.9	=8	4.9	21.2	2.6
LSD P = 0.05	1.2	4.2	4.8	3.4	1.8			1.0		
LSD P = 0.01	1.6	5.6	6.4	4.5	2.4			1.4		

* Samples assessed visually , scale 1-6, 3 = borderline, > 3 = too dark

Table 19. Yield of various weight grades, ranking, Tubers set per plant Quality aspects for potato lines Junior Fresh Winter 1998 harvest.

Entry	Yield, Tonnes Per Hectare						Rank by No.1 Grade	Tuber No. Per Plant	Quality	
	Chats 0-80g	Small 80-200g	Medium 200-350g	Large 350-450g	Over Size >450g	No.1 Grade 80-350g			% Dry Matter	Fry * Colour
Atlantic	2.7	5.7	2.5	0.7	0.2	8.2	32	3.3	23.0	3.0
Pontiac	3.8	6.6	6.7	3.1	2.6	13.3	11	4.5	16.6	5.0
Sebago	2.4	5.0	2.5	1.2	0.5	7.5	31	2.9	17.5	3.0
Winlock	3.3	11.3	6.2	0.9	0.5	17.5	1	4.5	21.7	3.0
92-5-4	5.0	7.5	2.4	0.3	0.0	9.8	24	4.3	22.0	3.0
92-6-8	3.5	7.5	1.6	0.3	0.0	9.1	26	3.9	19.3	2.0
92-11-1	2.1	5.0	3.6	0.5	0.0	8.5	29	3.7	18.9	5.0
92-13-2	4.2	7.9	2.9	0.5	0.0	10.8	21	3.9	20.9	3.0
92-13-11	4.2	13.0	3.5	0.8	0.2	16.5	3	7.9	21.0	4.0
92-19-6	3.8	9.9	4.3	0.3	0.0	14.2	9	5.3	18.7	4.0
92-22-5	5.2	9.5	3.4	0.5	0.4	13.0	12	5.6	19.9	4.0
92-40-5	3.1	10.9	5.6	1.4	0.8	16.4	4	5.9	22.2	3.0
92-61-10	2.9	6.5	4.7	0.9	0.0	11.2	19	4.2	18.7	3.0
92-68-9	2.8	6.0	2.8	1.0	0.2	8.9	27	3.5	17.9	5.0
92-96-3	3.6	9.8	8.2	3.5	0.9	18.0	2	5.4	17.7	4.0
92-99-4	4.2	10.6	2.8	0.0	0.2	13.4	10	5.3	19.9	2.0
92-102-12	2.6	6.9	2.6	0.7	0.0	9.5	25	6.1	20.5	1.0
92-102-13	2.7	6.9	0.2	0.0	0.0	7.2	33	3.5	20.0	1.0
92-113-9	3.7	3.0	0.2	0.2	0.0	3.2	35	3.4	20.1	4.0
92-117-6	1.7	4.0	0.6	0.0	0.0	4.7	34	2.2	21.4	3.0
92-118-2	3.7	7.6	2.6	0.2	0.5	10.2	23	4.4	19.2	5.0
93-5-5	6.4	9.7	2.5	1.3	0.0	12.2	15	6.4	20.7	3.0
93-5-9	4.7	11.0	3.3	0.4	0.2	14.3	8	4.8	21.5	2.0
93-14-4	3.0	7.7	4.6	1.9	0.4	12.3	13	4.7	23.0	4.0
93-17-8	3.3	8.9	3.1	0.0	0.0	11.9	16	4.8	20.1	4.0
93-17-16	3.6	12.6	3.6	0.2	0.0	16.2	5	4.9	18.7	4.0
93-18-17	3.5	8.5	3.1	0.7	0.0	11.6	17	5.9	18.3	5.0
93-20-10	5.8	11.5	3.8	0.6	0.2	15.4	7	5.8	17.6	4.0
93-21-5	2.3	6.4	4.7	0.5	0.0	11.1	20	3.7	19.7	4.0
93-36-1	3.4	12.3	3.6	0.0	0.0	15.7	6	5.5	22.6	4.0
93-38-1	1.8	6.5	5.1	1.2	0.0	11.6	18	3.4	19.3	3.0
93-38-42	2.2	6.6	2.1	0.5	0.0	8.8	28	4.2	21.5	4.0
93-44-3	0.9	2.2	0.2	0.0	0.3	2.4	36	3.8	18.8	4.0
93-87-1	2.8	6.9	3.5	0.8	0.7	10.5	22	4.7	18.2	4.0
93-121-2	1.6	4.7	3.4	0.6	0.4	8.1	30	3.0	20.8	3.0
93-124-10	1.6	5.0	7.2	1.4	0.2	12.3	14	4.5	18.8	3.0
LSD P = 0.05	1.6	3.4	2.4	1.6	0.6	4.7		1.9		
LSD P = 0.01	2.1	4.5	3.2	2.2	0.9	6.2		2.5		

* Samples assessed visually, scale 1-6, 3 = borderline, > 3 = too dark

Table 20. Yield of various weight grades, ranking, Tuber set per plant Quality aspects for potato lines Senior Fresh Winter 1998 harvest.

Entry	Yield. Tonnes Per Hectare						Rank by No.1 Grade	Tuber No. Per Plant	Quality	
	Chats	Small	Medium	Large	Over Size	No.1 Grade			% Dry Matter	Fry * Colour
	0-80g	80- 200g	200-350g	350-450g	>450g	80- 350g				
Atlantic	2.8	3.8	0.8	0.0	0.0	4.6	21	3.1	21.5	4.0
Pontiac	3.2	3.8	3.0	1.5	0.0	6.8	11	3.2	16.3	6.0
Sebago	2.1	3.1	1.8	0.2	0.0	4.9	20	2.3	17.4	4.0
Winlock	4.8	11.6	1.2	0.0	0.0	12.8	1	5.8	18.4	4.0
90-3-4	2.7	3.1	2.2	0.4	0.0	5.3	15	3.3	18.7	5.0
90-7-9	3.0	2.9	2.1	0.2	0.2	4.9	19	3.2	20.2	3.0
90-20-5	4.0	7.5	4.9	0.0	0.0	12.4	2	5.7	18.5	5.0
90-29-6	2.3	7.8	3.1	0.4	0.3	10.9	4	3.4	17.8	5.0
90-40-11	2.2	4.5	2.0	0.0	0.0	6.5	12	2.8	21.7	4.0
90-48-15	4.8	4.0	0.5	0.3	0.0	4.5	22	3.9	18.1	5.0
90-76-6	3.2	6.0	4.1	0.7	0.2	10.1	6	4.3	18.8	3.0
90-77-4	1.9	4.7	2.5	0.7	0.0	7.2	9	3.0	21.3	6.0
90-83-39	3.3	4.7	0.5	0.0	0.0	5.2	17	4.6	21.0	1.0
90-109-54	3.2	7.8	3.8	0.7	0.2	11.6	3	3.4	18.6	2.0
90-109-59	3.7	4.6	1.9	1.1	0.0	6.5	13	11.9	20.9	3.0
90-125-3	4.0	5.7	1.3	0.0	0.0	7.0	10	4.1	21.2	4.0
90-128-12	3.7	3.5	0.1	0.0	0.0	3.6	24	3.2	17.2	5.0
91-22-2	3.1	4.5	1.6	0.0	0.0	6.1	14	2.7	16.3	6.0
91-55-12	4.0	8.0	2.6	0.0	0.0	10.7	5	11.5	19.7	3.0
91-71-2	3.3	6.3	0.9	0.2	0.0	7.2	8	2.8	19.1	5.0
91-96-1	2.4	2.4	1.8	0.2	0.0	4.2	23	2.7	22.2	4.0
91-156-2	2.2	4.6	2.9	1.1	0.3	7.5	7	3.1	25.2	3.0
91-164-2	2.9	2.6	2.4	0.0	0.0	5.0	18	2.7	19.2	4.0
91-92-6	3.2	3.5	1.8	0.5	0.5	5.3	16	3.4	18.4	4.0
LSD P = 0.05	1.2	3.6	ns	0.7	ns	5.1		1.9		
LSD P = 0.01	1.6	4.8	ns	1.0	ns	6.8		2.5		

* Samples assessed visually, scale 1-6, 3 = borderline, > 3 = too dark
 ns denotes not significantly different at p=0.05.

Table 21. Yield of various weight grades, ranking, Tuber set per plant Quality aspects for potato lines Senior Fresh Spring 1998 harvest.

Entry	Yield, Tonnes Per Hectare						Rank by No.1 Grade	Tuber No. Per Plant	Quality	
	Chats 0-80g	Small 80-200g	Medium 200-350g	Large 350-450g	Over Size >450g	No.1 Grade 80-350g			% Dry Matter	Fry * Colour
Atlantic	3.0	12.9	0.6	0.2	0.0	13.5	20	4.2	23.0	1.0
Pontiac	9.2	18.2	0.3	0.3	0.0	18.5	10	6.2	17.0	3.0
Sebago	4.7	9.4	0.6	0.0	0.0	10.0	23	5.8	17.5	3.0
Winlock	7.7	21.2	1.4	0.0	0.4	22.6	4	8.8	19.1	3.0
Gold	6.1	13.3	2.4	0.0	0.0	15.7	15	6.5	21.6	2.0
90-7-9	9.4	15.8	1.6	0.0	0.0	17.4	13	6.6	20.9	1.0
90-20-5	9.5	20.8	1.1	0.0	0.0	21.9	6	7.5	18.8	2.0
90-40-11	4.8	17.5	5.1	0.0	0.0	22.6	5	6.9	20.9	2.0
90-48-15	5	16.5	3.2	0.0	0.0	19.6	9	11.5	18.2	3.0
90-77-4	7.9	13.3	1.0	0.0	0.0	14.3	18	6.3	18.2	4.0
90-109-54	9.1	18.3	1.5	0.3	0.0	19.8	7	7.3	20.3	2.0
91-22-2	6.9	15.1	0.0	0	0.0	15.1	16	7.0	18.6	5.0
91-71-2	9.1	10.2	0.2	0.0	0.0	10.3	22	6.0	21.3	3.0
91-96-1	4.0	20.6	7.5	1.0	0.0	28.1	1	8.0	21.7	3.0
91-164-2	10.2	9.0	0.0	0.0	0.0	9.0	24	6.1	21.6	1.0
91-92-6	3.7	14.6	3.6	0.5	0.0	18.1	11	6.7	20.2	3.0
89/12/1	2.2	13.1	1.5	0.3	0.0	14.6	17	4.7	21.2	1.0
89/22/5	7.9	17.8	0.4	0.0	0.0	18.2	12	4.3	25.2	1.0
89/55/6	12.5	13.5	0.0	0.0	0.0	13.5	19	8.2	19.4	2.0
90/7/17	13.7	15.8	0.2	0.0	0.0	15.9	14	9.5	24.1	3.0
90/40/1	4.5	24.4	3.4	0.0	0.0	27.8	2	9.2	18.8	3.0
90/105/14	8.5	12.5	0.6	0.0	0.0	13.1	21	6.1	18.6	2.0
93/6/3	5.0	18.9	0.7	0.0	0.0	19.7	8	6.8	21.6	3.0
93/7/11	4.0	20.2	5.0	0.3	0.0	25.2	3	7.5	19.2	3.0
LSD P= 0.05	2.6	6.2	2.4	0.4	0.2	6.8		3.0		
LSD = 0.01	3.5	8.4	3.3	0.5	0.3	9.3		4.1		

* Samples assessed visually, scale 1-6, 3 = borderline, > 3 = too dark

Table 22. Yield of various weight grades, ranking, tuber set per plant Quality aspects for potato lines Junior Fresh Spring 1998 harvest.

Entry	Yield. Tonnes Per Hectare						Rank by No.1 Grade	Tuber No. Per Plant	Quality		
	Chats		Medium		Large				No.1 Grade 80-350g	% Dry Matter	Fry * Colour
	0-80g	80-200g	200-350g	350-450g	>450g	Over Size >450g					
Atlantic	2.9	11.3	1.1	0.2	0.0	12.4	26	4.7	21.7	3.0	
Pontiac	9.9	14.6	0.4	0.0	0.0	15.0	20	7.4	17.2	4.0	
Sebago	3.7	17.7	3.2	0.0	0.0	20.9	9	5.7	18.3	2.0	
Wimlock	7.7	21.2	1.4	0.0	0.4	22.6	4	4.5	19.1	3.0	
92-5-4	3.5	8.3	1.5	0.6	0.0	9.8	30	3.6	22.0	2.0	
92-6-8	3.5	13.8	0.3	0.0	0.0	14.2	24	4.5	20.6	2.0	
92-11-1	4.9	16.3	1.3	0.2	0.0	17.7	16	6.3	18.5	1.0	
92-13-2	6.2	11.9	0.0	0.0	0.0	11.9	27	6.4	21.1	2.0	
92-13-11	6.2	17.9	0.9	0.0	0.0	18.8	15	6.0	22.3	3.0	
92-19-6	6.2	23.6	5.0	0.2	0.0	28.7	1	8.0	18.9	2.0	
92-22-5	4.1	18.6	1.7	0.0	0.0	20.3	12	5.4	19.4	3.0	
92-40-5	4.2	17.2	3.7	0.0	0.0	20.9	10	10.8	20.7	3.0	
92-61-10	2.7	11.4	0.3	0.0	0.0	11.7	28	5.4	20.0	3.0	
92-68-9	2.6	12.4	0.5	0.0	0.0	12.9	25	4.4	16.7	3.0	
92-96-3	3.6	18.8	5.6	0.0	0.0	24.3	3	5.0	18.9	3.0	
92-99-4	3.9	15.3	1.0	0.0	0.0	16.3	18	5.9	21.5	3.0	
92-102-12	7.6	9.6	0.2	0.0	0.0	9.8	31	5.8	21.4	3.0	
92-102-13	10.7	8.2	0.2	0.0	0.0	8.4	33	6.5	22.3	4.0	
92-113-9	2.8	5.1	0.0	0.0	0.0	5.1	36	6.3	22.0	3.0	
92-117-6	3.9	1.3	0.0	0.0	0.0	1.3	40	3.2	20.9	3.0	
92-118-2	2.5	13.2	1.9	0.0	0.0	15.2	19	3.9	20.3	3.0	
93-5-5	7.3	6.2	0.5	0.0	0.0	6.7	34	5.5	21.8	3.0	
93-5-9	5.1	0.8	0.8	0.0	0.0	1.7	38	6.3	20.8	2.0	
93-14-4	2.2	4.6	4.6	0.0	0.0	9.3	32	9.3	19.2	4.0	
93-17-8	4.2	0.7	0.7	0.0	0.0	1.5	39	4.8	18.3	5.0	
93-17-16	14.3	17.6	5.0	0.0	0.0	22.7	6	8.8	18.5	3.0	
93-20-10	7.1	12.8	2.0	0.0	0.0	14.8	22	7.4	18.9	5.0	
93-21-5	3.7	19.8	1.5	0	0	21.3	8	7.7	19.2	5.0	
93-36-1	1.5	5.57	0.4	0	0	6.01	35	2.1	21.8	2.0	
93-38-1	7.9	4.4	0.3	0.0	0.0	4.7	37	6.1	16.7	4.0	
93-38-42	5.8	14.5	0.4	0	0.0	14.9	21	5.1	20.8	3.0	
93-44-3	2.6	11.0	3.7	0.0	0.0	14.7	23	6.3	19.1	3.0	
93-87-1	2.9	16.7	4.2	0.0	0.0	20.9	11	5.9	19.2	3.0	
93-124-10	2.8	15.6	5.8	0.0	0.0	21.4	7	5.4	20.6	4.0	
94-13-2	3.2	17.5	1.5	0.0	0.0	19.0	14	5.1	18.0	3.0	
94-26-2	6.9	23.2	0.0	0.0	0.0	23.2	5	6.7	26.2	3.0	
94-28-1	5.8	18.6	1.2	0.0	0.0	19.8	13	7.2	25.7	3.0	
94-94/95-9	4.4	20.9	3.0	0.0	0.0	23.9	4	5.2	25.0	2.0	
94-97-2	2.1	21.3	4.6	0.0	0.0	25.8	2	8.1	20.9	3.0	
94-103-11	7.3	11.7	0	0	0.0	11.71	29	5.3	19.6	3.0	
94-111-23	6.5	15.7	0.9	0	0.0	16.6	17	6.0	21.2	3.0	
LSD P=0.05	2.0	4.2	3.1	0.3	0.0	6.1		2.4			
LSD 1%	2.7	5.6	4.2	0.4	0.0	8.2		3.2			

* Samples assessed visually, scale 1-6, 3 = borderline, > 3 = too dark

Table 23. Yield of various weight grades, ranking, Tuber set per plant Quality aspects for potato lines Senior Fresh Winter 1999 harvest.

Entry	Yield. Tonnes Per Hectare.						Rank	Tuber	Quality	
	Chats 0-80g	Small 80- 200g	Medium 200-350g	Large 350-450g	Over Size >450g	No.1 Grade 80- 350g	by No.1 Grade	No. Per Plant	% Dry Matter	Fry * Colour
Atlantic	2.37	27.0	3.2	1.1	0.6	31.3	13	5.2	23.6	1.0
Pontiac	2.62	14.1	15.7	4.6	4.3	34.3	9	5.9	18.0	4.0
Sebago	2.57	28.9	7.1	0.7	0.4	36.7	5	6.3	17.9	3.0
Winlock	4.15	24.1	3.2	0.2	0.0	27.6	17	6.0	20.0	3.0
Gold Star	4.9	26.2	4.2	1.8	0.8	32.2	10	7.5	19.9	4.0
Ruby Lou	3.16	19.0	11.4	1.4	0.3	31.8	11	6.0	19.7	3.0
90/7/9	3.94	25.9	13.9	1.2	0.0	41.0	1	7.4	21.0	4.0
90/20/5	4.43	19.6	10.2	1.7	0.3	31.5	12	7.4	20.3	4.0
90/40/11	2.37	17.4	11.8	1.9	0.4	31.07	14	5.6	19.0	3.0
90/48/15	3.46	20.0	14.2	1.6	1.7	35.8	6	7.9	18.8	5.0
90/77/4	3.26	17.6	7.9	0.4	0.0	25.9	20	5.2	20.7	3.0
90/109/54	3.2	20.4	6.1	2.71	0.9	29.2	16	5.4	20.8	5.0
91/22/2	4.65	22.9	3.5	0.3	0.0	26.7	19	6.6	19.7	2.0
91/71/2	3.26	17.6	8.9	1.0	0.0	27.5	18	7.2	22.6	4.0
91/96/1	3.87	18.8	16.8	1.5	0.3	37.0	4	6.8	22.8	3.0
91/164/2	5.71	16.5	6.8	1.1	0.0	24.3	21	6.9	17.2	4.0
91/92/6	4.46	20.3	8.2	1.0	1.4	29.4	15	6.4	18.2	3.0
89/12/1	2.38	22.0	14.0	0.7	1.6	36.7	7	6.4	22.0	4.0
89/22/5	4.52	26.9	11.4	1.8	0.3	40.1	2	7.6	18.0	4.0
89/55/6	8.87	22.3	0.4	0.0	0.0	22.65	23	9.6	20.3	3.0
Crispa	8.57	22.9	1.3	0.0	0.0	24.2	22	8.9	22.5	3.0
Shine	6.17	15.9	2.2	0.2	0.0	18.4	24	6.9	19.9	3.0
93/6/3	3.26	29.7	8.3	0.0	0.0	37.9	3	6.4	25.3	4.0
93/7/11	4.01	17.6	15.6	2.3	0.6	35.5	8	6.3	21.6	4.0
LSD = 0.5	1.6	14.4	8.9	1.9	1.2	13.8		2.0		

* Samples assessed visually , scale 1-6, 3 = borderline, > 3 = too dark

Table 24. Yield of various weight grades, ranking, Tuber set per plant Quality aspects for potato lines Junior Fresh Winter 1999 harvest.

Entry	Yield. Tonnes Per Hectare						Rank by No.1 Grade	Tuber No. Per Plant	Quality	
	Chats	Small	Medium	Large	No.1 Grade	Over Size			% Dry Matter	Fry * Colour
	0-80g	80- 200g	200-350g	350-450g	80- 350g	>450g				
Atlantic	2.0	18.2	17.2	2.1	37.5	0.0	6	5.4	23.6	1
Pontiac	2.8	15.1	19.2	4.4	38.7	4.5	4	5.9	18.0	5
Sebago	3.2	29.8	10.2	0.8	40.8	1.0	2	6.9	-	3
92-5-4	6.0	16.9	4.0	0.7	31.3	0.0	19	6.1	20.7	2
92-6-8	2.4	12.9	7.4	0.8	21.1	0.3	36	3.7	21.6	5
92-11-1	3.2	18.7	4.2	0.5	23.4	0.0	32	5.1	22.3	4
92-13-2	2.9	19.8	13.1	0.2	33.1	0.2	12	6.3	20.2	3
92-13-11	4.6	17.9	8.5	0.0	26.5	0.0	28	5.9	22.7	3
92-19-6	6.7	31.4	16.3	2.4	50.0	0.6	1	9.8	17.9	3
92-22-5	1.1	11.1	14.7	2.8	28.6	0.9	24	3.5	20.1	3
92-40-5	2.9	18.1	6.8	1.3	26.1	0.3	29	5.3	20.4	3
92-61-10	1.9	16.9	9.2	3.5	29.6	0.0	20	4.2	16.1	3
92-68-9	2.6	14.6	12.7	4.1	31.3	2.8	18	4.7	17.4	5
92-96-3	3.3	16.1	13.4	2.4	31.9	3.0	15	5.3	21.4	4
92-99-4	2.7	15.0	6.9	0.7	22.6	0.0	34	4.3	22.5	2
92-102-12	2.8	13.6	7.9	0.7	22.2	0.0	35	4.5	19.6	2
92-10213	3.6	18.9	6.2	0.5	25.5	0.0	30	5.3	18.9	2
92-113-9	4.6	13.2	2.5	1.0	16.7	0.3	37	5.2	18.7	3
92-117-6	4.4	2.0	0.0	0.0	2.0	0.0	39	5.4	20.1	3
92-118-2	2.6	15.9	14.1	1.8	31.8	0.0	16	5.2	19.0	2
93-5-5	4.1	8.2	4.3	0.7	13.3	0.0	38	5.8	22.0	3
93-5-9	5.7	17.2	9.4	0.3	26.9	0.0	26	6.1	18.0	3
93-14-4	3.4	17.4	13.8	2.8	34.0	0.3	11	5.8	20.3	4
93-17-8	3.9	19.4	15.5	2.7	37.6	0.8	5	6.8	22.5	4
93-17-16	4.2	18.7	12.5	0.4	31.6	0.0	17	5.9	19.7	3
92-20-10	4.4	22.1	12.4	1.5	36.0	0.0	8	6.2	19.9	3
93-21-5	3.6	21.1	12.5	1.4	35.1	0.6	10	6.1	19.2	3
93-36-1	3.6	17.8	14.7	3.0	35.5	1.0	9	5.4	21.6	3
93-38-1	3.0	16.0	5.8	0.9	22.7	0.3	33	5.0	21.0	3
93-38-42	3.6	16.1	8.3	0.2	24.7	0.6	31	5.8	20.3	3
93-44-3	2.2	18.4	9.7	1.5	29.6	0.6	21	4.0	20.0	5
93-87-1	2.5	14.3	9.5	2.9	26.7	2.7	27	5.2	18.8	3
93-124-10	3.2	13.7	13.3	2.4	29.4	2.5	22	4.7	20.7	3
94-13-2	3.4	15.4	14.5	3.1	33.0	0.9	14	6.5	22.5	1
94-28-1	4.0	21.8	10.5	0.7	33.0	0.0	13	7.0	20.4	2
94-64-65-9	4.1	16.9	8.1	2.2	27.3	0.3	25	6.0	22.4	2
94-97-2	3.9	24.3	13.5	1.6	39.4	0.3	3	6.8	21.6	3
94-103-11	6.9	20.1	15.5	1.4	37.0	0.0	7	5.5	22.0	3
94-111-23	2.8	14.2	15.1	0.0	29.3	0.3	23	4.2	18.5	3
LSD P=0.05	NS	8.67	9.42	NS	13.47	NS		2.05		

* Samples assessed visually , scale 1-6, 3 = borderline, > 3 = too dark

Table 25. Yield of various weight grades, ranking, Tuber set per plant Quality aspects for potato lines Junior Fresh Spring 1999 harvest.

Entry	Yield, Tonnes Per Hectare						Rank by No.1 Grade	Tuber No. Per Plant	Quality	
	Chats 0-80g	Small 80- 200g	Medium 200-350g	Large 350-450g	Over Size >450g	No.1 Grade 80- 350g			% Dry Matter	Fry * Colour
Atlantic	3.7	16.8	17.3	1.9	1.0	36.0	26	5.3	17.5	2
Crispa	6.8	19.6	5.1	0.0	0.2	24.7	33	6.4	-	2
Dawmor	10.5	27.1	6.1	0.4	0.2	33.7	28	8.6	17.8	3
Pontiac	2.0	11.0	23.2	7.9	4.4	42.0	5	4.6	18.1	5
Ruby Lou	3.2	11.3	21.8	8.2	3.8	41.3	10	4.9	18.5	-
Sebago	4.3	20.8	15.7	2.3	0.4	38.9	17	6.2	20.7	2
Winlock	6.1	21.1	15.8	1.2	0.6	38.1	19	6.7	20.1	4
96-101-2	2.5	13.9	20.6	2.2	0.2	36.7	25	4.8	17.4	3
96-102-4	2.4	14.6	17.0	2.6	0.0	34.2	27	4.4	17.3	4
96-107-3	3.6	13.4	19.5	6.4	1.4	39.3	13	5.1	16.1	3
96-135-3	6.5	18.3	6.8	0.8	0.0	25.9	32	6.0	16.8	3
96-24-2	2.0	11.2	18.7	9.2	3.0	39.1	16	4.5	-	3
96-24-5	10.1	27.4	10.0	0.3	0.0	37.7	22	9.3	17.2	3
96-25-1	3.6	16.5	17.0	5.6	3.8	39.1	14	5.4	16.4	3
96-26-6	4.6	19.0	15.2	3.3	0.6	37.5	23	6.0	18.3	2
96-27-5	2.5	13.5	20.5	6.5	3.1	40.5	11	5.1	16.1	3
96-27-6	2.4	15.1	19.3	2.4	0.6	36.8	24	4.9	17.1	-
96-28-5	13.8	14.1	2.7	0.2	0.3	17.0	34	7.8	-	-
96-29-21	6.4	26.9	15.3	1.1	0.0	43.4	3	7.9	15.8	-
96-29-26	1.7	10.0	15.8	0.8	0.6	26.5	31	3.6	17.5	3
96-29-5	7.2	24.0	15.6	2.4	0.5	42.0	6	7.6	-	3
96-32-15	4.5	19.0	24.4	4.9	0.4	48.4	1	6.6	14.3	4
96-32-2	6.4	20.3	19.6	2.5	1.0	42.3	4	7.3	17.9	3
96-32-24	3.2	14.7	18.9	8.2	2.0	41.8	8	5.2	17.1	-
96-32-29	3.2	14.4	21.1	6.0	1.4	41.5	9	5.3	14.3	3
96-32-43	2.2	9.0	18.1	12.0	12.6	39.1	15	4.8	-	4
96-32-8	1.6	9.8	17.8	10.3	2.6	37.9	20	4.0	16.7	4
96-37-1	4.6	26.3	14.8	0.8	0.0	41.9	7	6.9	15.0	3
96-59-6	3.8	15.9	13.1	0.9	0.0	30.0	29	5.0	19.7	4
96-70-6	4.3	15.1	19.8	5.3	0.0	40.2	12	5.6	17.4	-
96-74-1	4.1	18.0	18.6	1.7	0.0	38.3	18	5.7	17.8	3
96-87-10	3.6	13.4	19.2	5.3	0.5	37.9	21	5.0	-	3
96-87-2	2.9	15.5	21.7	7.0	3.7	44.1	2	5.6	16.4	3
96-92-7	3.0	10.9	14.6	3.4	0.4	28.9	30	4.3	16.9	3
LSD P=0.05	2.04	5.83	7.01	4.04	2.62	9.71		1.31	2.67	

* Samples assessed visually, scale 1-6, 3 = borderline, > 3 = too dark

Table 26. Yield of various weight grades, ranking, Tuber set per plant Quality aspects for potato lines Senior Fresh Spring 1999 harvest.

Entry	Yield. Tonnes Per Hectare						Rank by No.1 Grade	Tuber No. Per Plant	Quality	
	Chats	Small	Medium	Large	Over Size	No.1 Grade			% Dry Matter	Fry * Colour
	0-80g	80-200g	200-350g	350-450g	>450g	80-350g				
Atlantic	3.7	16.8	17.3	1.9	1.0	36.0	10	5.3	17.5	2
Crispa	6.8	19.6	5.1	0.0	0.2	24.7	22	6.4	-	2
Dawmor	10.5	27.1	6.1	0.4	0.2	33.7	11	8.6	17.8	3
Pontiac	2.0	11.0	23.2	7.9	4.4	42.0	3	4.6	18.1	5
Ruby Lou	3.2	11.3	21.8	8.2	3.8	41.3	4	4.9	18.5	-
Sebago	4.3	20.8	15.7	2.3	0.4	38.9	7	6.2	20.7	2
Winlock	6.1	21.1	15.8	1.2	0.6	38.1	9	6.7	20.1	4
106-32-40	3.0	14.7	19.9	5.7	3.4	40.2	6	5.1	15.5	4
92-102-13	5.3	19.0	9.5	3.1	0.6	31.6	14	5.8	18.3	3
92-11-1	2.7	11.3	10.7	4.2	1.5	26.1	19	3.9	15.6	4
92-11-1Vic	2.6	11.4	20.4	6.5	1.3	38.2	8	4.6	15.7	3
92-19-6	5.0	27.2	23.3	2.6	0.4	53.1	1	7.7	-	3
92-22-5	4.1	14.0	11.8	2.1	0.0	27.9	16	4.6	17.0	3
92-40-5	4.8	15.5	6.1	1.6	0.0	23.2	23	4.5	18.4	3
93-14-4	0.0	0.0	0.0	0.0	0.0	0.0	24	0.0	-	-
93-17-16	3.5	12.6	11.0	4.1	1.4	27.7	17	4.5	17.7	3
93-36-1	2.9	12.0	14.2	3.4	1.7	29.7	15	4.3	17.7	3
93-38-42	4.2	14.2	9.4	1.8	0.0	25.4	21	4.4	16.9	3
93-87-1	1.9	7.3	12.7	5.6	2.0	25.6	20	3.3	17.5	3
94-13-2	1.7	7.7	14.1	5.5	5.5	27.3	18	3.3	17.5	2
94-28-1	3.9	13.8	17.3	1.9	0.6	32.9	13	5.0	19.2	3
94-28-1 Vic	5.1	22.5	10.4	0.1	0.0	33.1	12	6.0	18.6	3
94-64/65-9	4.4	19.0	19.2	2.9	0.7	41.1	5	6.1	18.4	2
94-97-2	4.8	16.9	22.9	11.2	4.0	51.0	2	6.4	-	4
LSD P=0.05	2.38	5.69	7.60	4.06	2.42	10.25		1.31	2.84	

* Samples assessed visually , scale 1-6, 3 = borderline, > 3 = too dark

Table 27. Yield of various weight grades, ranking, Tuber set per plant Quality aspects for potato lines Technology transfer Spring 1999 harvest.

Entry	Yield. Tonnes Per Hectare						Rank by No.1 Grade	Tuber No. Per Plant
	Chats	Small	Medium	Large	Over Size	No.1 Grade		
	0-80g	80-200g	200-350g	350-450g	>450g	80-350g		
Snowgem	1.9	15.6	21.2	3.8	1.5	36.7	4	4.9
Shine	4.5	16.8	16.4	2.3	3.4	33.1	6	5.4
Sebago	3.1	15.6	17.5	4.2	0.6	33.1	7	5.0
Ruby Lou	2.7	15.6	21.9	5.6	2.1	37.4	3	5.3
Red Ruby	3.0	12.5	15.9	3.1	0.3	28.5	9	4.3
Red la Soda	2.2	17.4	21.0	7.2	2.6	38.4	2	5.5
Pontiac	3.5	17.4	18.6	8.4	5.2	36.0	5	5.8
Nadine	4.9	14.2	10.5	0.7	0.0	24.7	11	5.6
Fontenot	2.5	9.2	15.1	4.7	1.1	24.2	13	3.6
Desiree	2.0	12.8	12.8	6.5	2.1	25.7	10	4.0
Coliban	1.0	5.0	4.3	1.3	0.3	9.3	15	1.5
92-19-6	5.1	27.7	23.7	2.7	0.4	51.3	1	7.7
92-19-4	3.5	15.4	13.4	1.7	0.9	28.8	8	4.5
92-19-10	3.0	10.5	13.9	7.4	2.1	24.4	12	4.2
86-31-5	1.9	8.4	12.8	4.1	2.4	21.2	14	3.3
LSD P=0.05	1.11	5.75	6.15	3.64	ns	7.03		1.38

* Samples assessed visually , scale 1-6, 3 = borderline, > 3 = too dark
 ns denotes not significantly different at p=0.05.

Table 28. Yield of various weight grades, ranking, Tuber set per plant Quality aspects for potato lines Winter 2000 harvest.

Entry	Yield. Tonnes Per Hectare						Rank by No.1 Grade	Tuber No. Per Plant	Quality	
	Chats	Small	Medium	Large	Over Size	No.1 Grade			% Dry Matter	Fry * Colour
	0-80g	80-200g	200-350g	350-450g	>450g	80-350g				
Atlantic	2.3	16.7	20.4	4.0	1.0	37.1	3	3.6	20.1	1.5
Crispa	6.1	28.6	2.4	0.0	0.0	31.0	17	5.5	21.7	1.5
Dawmor	8.3	29.3	2.2	0.5	0.3	31.5	13	6.4	19.3	1.5
Pontiac	3.0	18.8	15.8	4.0	1.2	34.6	7	4.1	16.6	-
Ruby Lou	3.1	21.4	10.3	0.5	0.0	31.7	12	4.0	20.1	1.5
Sebago	3.3	20.4	11.3	2.6	0.0	31.7	11	4.2	16.8	4.0
Winlock	6.3	21.4	5.0	0.3	0.0	26.5	21	4.9	18.4	4.0
92-19-6	3.8	28.7	14.2	0.8	0.0	42.9	1	5.3	17.6	2.5
94-97-2	6.9	31.9	6.5	0.0	0.0	38.4	2	6.3	15.6	3.5
94-64/65-9	2.6	14.4	11.2	4.6	1.0	25.6	23	3.3	17.7	2.5
96-24-2	2.6	15.4	13.7	2.6	1.3	29.1	19	3.4	19.4	2.5
96-32-2	7.8	23.8	4.6	0.3	0.0	28.5	20	5.7	18.5	3.5
96-32-8	3.0	16.1	15.2	1.7	0.7	31.3	15	3.8	17.6	3.0
96-32-15	6.6	24.6	6.7	0.0	0.0	31.2	16	5.8	16.1	5.5
96-32-24	5.2	23.1	8.1	0.8	0.0	31.2	16	5.1	17.4	4.0
96-32-29	3.8	20.9	11.8	0.8	0.3	32.6	9	4.4	15.6	3.5
96-32-43	2.6	14.0	22.9	7.1	3.5	36.8	4	3.8	17.4	3.0
96-37-1	2.1	18.1	16.9	2.4	0.7	35.0	5	3.7	16.9	2.5
96-70-6	4.2	19.5	10.5	0.6	0.0	29.9	18	4.4	21.3	2.0
96-74-1	5.0	17.6	8.1	0.2	0.0	25.7	22	4.2	18.2	4.5
96-87-2	4.5	20.4	11.0	2.6	0.0	31.5	14	4.7	16.4	5.5
96-107-3	4.4	26.7	8.0	0.0	0.0	34.8	6	5.0	15.6	2.5
96-25-1	4.7	25.5	8.8	0.7	0.0	34.4	8	5.0	17.7	2.0
96-27-5	5.2	22.7	9.8	1.0	0.3	32.5	10	5.6	18.1	1.0
96-29-5	7.1	23.1	2.3	0.0	0.0	25.3	24	5.2	16.4	2.5
LSD P=0.05	1.68	5.81	4.53	2.67	1.16	7.08		1.02	1.92	

* Samples assessed visually , scale 1-6, 3 = borderline, > 3 = too dark .

6. Technology Transfer

Within the project Technology Transfer has been achieved through grow out trials held on commercial farms for Spring crops in 1996 and 1997. Best option varieties were planted and grown using commercial practices and a field day held in conjunction with the harvest. These field days were only adequately attended. In 1998 seed of new varieties was not available hence no technology transfer trial was conducted. Technology transfer trials were also held at Kairi Research Station Northern Queensland in 1996, 1997 and 1998. In 1999 technology transfer trials were conducted at the Gatton Research Station and the field day held in conjunction with this was well attended. Growers attending these field days have shown considerable interest in some of the new varieties. Technical results have also been published in Potatoes Australia.

7. Recommendations

The development of new varieties to meet market requirements is critical if the Queensland fresh market potato industry is to remain competitive.

Key Outcomes

- ◆ Several good lines have been developed in this project but these need to be cleaned of virus and re-evaluated under Queensland conditions.
- ◆ Two lines in particular appear to have virus resistance (92-19-6 and 94-97-2), these lines need to be included in the breeding program.

Queensland industry requirements

- ◆ The evaluation program needs to continue in a different form. The Queensland industry is heavily fresh market focussed and with a decline in the quantity of crisping potatoes grown more growers will be growing fresh and export market potatoes particularly in northern Queensland.
- ◆ A focus on producing good washed lines is critical, as this is where future markets will be and certainly the higher value markets.
- ◆ Dual market varieties that will wash and also chip are desirable. The standard for washing potatoes is very high and growers need an alternative market in the event their product does not meet specification.
- ◆ Future Queensland varietal evaluation programs need to have a commercialisation strategy built in.
- ◆ The requirements of retailers needs to be duly considered when assessing what is required in a potato.

Experimental rigour

- ◆ In future Queensland trials fresh seed material needs to be sourced each year.
- ◆ Seed should be produced in Victorian districts that are capable of supplying early seed, preferably between February and April.
- ◆ Queensland scientists should be playing a greater role in identifying good parent breeding lines and directing the types of crosses required to meet Queensland conditions.

Research efficiency

- ◆ At least 4 tubers of each clone need to be received in the first year of trialing. These clones are to be large enough to cut into at least 4 pieces. Thus 16-20 plants could be planted in the initial screening. This will allow us to cull more heavily in the early stages and reduce the number of varieties being screened.
- ◆ The size of plots can also be reduced in length and single row plots planted instead of double row plots. An increase in replication from 3 to 6 will allow for greater scientific rigour. Overall there would be a reduction in net area and volume grown whilst enhancing scientific rigour. The reduction in area grown will enable us to focus on washing all replicates and better judge good washing lines.
- ◆ The combination of reduced number of clones to be evaluated (through heavier culling early) and reduced area grown through altered experimental design will allow more efficient resource utilisation.

8. Bibliography

Kirkham, R., Wilson, G., Dawson, P., Mortimer, J., Hingston, L., Duff, A. and Williams, C. (1998) Increase profits with new varieties. *Potato Australia* 9:32-5.

Kirkham, R., Wilson, G., Williams, C., Dawson, P., Mortimer, J., Hingston, L. and Harper, S. (1998). New Varieties for the potato industry from NaPIES. *Potato Australia* 10:28-31.

Jackson, K.J., Duff, A.A., Johnson, I. and O'Donnell, W. (1997) *Potato Improvement and Evaluation in Queensland*. HRDC Final Report for Project PT513 February 1997.

Kirkham, R., Harper, S., Hingston, L., Dawson, P., and Williams, C. (1999) *Potato cultivar trials in Australia 1998-99*. Agriculture Victoria.

Kirkham, R., Harper, S., Hingston, L., Dawson, P., and Williams, C. (1998) *Potato cultivar trials in Australia 1997-98*. Agriculture Victoria.

Kirkham, R., Wade, S., Jackson, K., Hingston, L., Dawson, P., and Williams, C. (1997) *Potato cultivar trials in Australia 1996-97*. Agriculture Victoria.

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