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National asparagus cultivar trial no. 3: results of the 1995 harvest

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1 EXECUTIVE SUMMARY

The National Asparagus Cultivar Trial No. 3 was started in 1991 to evaluate the performance of promising new cultivars in New Zealand. This report presents results from the 1995 spear harvest in which four of the original six trials were harvested, one each in Hawke's Bay, Manawatu, Bay of Plenty and Waikato. A trial in South Canterbury was abandoned after the 1994 harvest due to poor plant survival, and no results for 1995 were received from a second trial in Hawke's Bay.

The trial in Hawke's Bay was planted in spring 1991, and was harvested for the third time in 1995. There were 37 harvests during the 74 day harvest period from 27 September to 9 December 1995. Of the ten cultivars in the trial, the four that had produced the best yields in the short 1994 harvest (JWC1, JAG1, Jersey Giant and Taramea) were again the best. Among these, JAG1 and JWC1 produced the highest total spear yields and numbers, and Jersey Giant was better than Taramea. JWC1 was the best overall because it had a higher proportion of saleable export spears. Apollo, Atlas, Astora and, especially, Pacifica, had the poorest performance. JAG1, JWC1 and Taramea had the best plant survival and fern vigour.

The trial in Manawatu was also planted in spring 1991, and was harvested for the third time in 1995. There were 66 harvests during the 80 day harvest period from 25 September to 13 December 1995. The best cultivars were JWC1 and JAG1 followed by Jersey Giant. They had also performed well in the shorter harvests in the previous two years. Among these cultivars, JWC1 was again the best overall because it had a higher proportion of saleable export spears. In the previous years, Taramea had performed well but it was well behind Jersey Giant in 1995. Apollo, Atlas and UC157 had the poorest performance. Jersey Giant, Astora, JAG1, JWC1 and CRAS25 had the best plant survival.

Therefore, the four cultivars that had produced the best yields in the shorter 1994 harvest (JWC1, JAG1, Jersey Giant and Taramea) were again the best in both the Hawke's Bay and Manawatu trials in 1995. Among those four, JWC1 and JAG1 were clearly ahead of the others. In turn, Jersey Giant was better than Taramea.

The 1995 harvests of the Bay of Plenty and Waikato trials were both short and yields were low. In the Bay of Plenty trial, which was planted in spring 1993 and harvested for the second time in 1995, there were 18 harvests in the 21 day harvest period from 18 September to 8 October 1995. The Waikato trial was planted in spring 1994 and harvested for the first time in 1995. There were eight harvests over the 15 day period

from 22 September to 6 October 1995. Differences among the cultivars are identified in the report, but no firm conclusions are possible about their relative merits. More results are needed from further harvests before reliable cultivar comparisons will be possible.

2 INTRODUCTION

The National Asparagus Cultivar Trial No. 3 was started in 1991 to evaluate the performance of promising new cultivars. Most of the cultivars came from plant improvement programmes in New Zealand and the USA.

Four trials were planted in spring 1991, two in Hawke's Bay, one in Manawatu, and one in South Canterbury. Two more trials were planted in Bay of Plenty and Waikato, in spring 1993 and 1994 respectively.

The South Canterbury trial was abandoned after the 1994 harvest due to poor plant survival, and no results for 1995 were received from one of the Hawke's Bay trials.

This report presents results from the 1995 harvests of the remaining four trials in Hawke's Bay, Manawatu, Bay of Plenty and Waikato.

3 METHODS

Data were received from the operators of the four trials in varying formats:

1. Hawke's Bay trial, managed and harvested by M. Russell; 37 harvests over a 74 day period; daily hand-recorded data were reported on result sheets provided at the start of the season.

2. Manawatu trial, managed and harvested by W. Stiefel; 66 harvests over an 80 day period; daily hand-recorded data were reported on result sheets provided at the start of the season.

3. Bay of Plenty trial, managed by D. Jones and harvested by L. McKeown; 18 harvests over a 21 day period; data provided on a floppy disk in Excel spreadsheets.

4. Waikato trial, managed and harvested by B. And H. Eliot; 8 harvests over a 15 day period, data provided as a hand-recorded summary of the total spear yield and number in each spear class. Daily harvest data from individual plots were not provided.

Data from all trials were entered into Quattro-Pro spreadsheets and collated into plant survival, spear yield and spear number categories as shown in the tables of results in the following sections. Differences among cultivars for each characteristic were determined by standard analysis of variance for a randomised complete block design using the Genstat statistical package. In the tables, the following statistical information is included with each set of results:

1. Significance of differences among cultivars:
   NS = not significant
   * = significant at the 1% level of probability
   ** = significant at the 1% level of probability
   *** = significant at the 0.1% level of probability

2. Least significant difference (LSD). Differences between values that are greater than the LSD are significant at the 5% level of probability.

3. Coefficient of variation (CV). A measure of the background variability (i.e. variability not caused by cultivar differences) in the trial.

No statistical tests were done on the results from the Waikato trial because data for individual plots were not provided.

4 HAWKE'S BAY TRIAL

4.1 Trial Information

(i) Cultivars There are 10 cultivars in the trial:

Jersey Giant (Syn 4-56)	UC157
Taramea	Astora
JAG1	JWC1
Apollo	Atlas
Pacifica (CP2)	CP1

(ii) Site description

Location:	M. Russell, Rosser Road, Mangaroa, Hastings
Soil type:	Pakipaki sandy loam
Paddock history:	Long-term pasture

(iii) Planting details

Planting date:	13 December 1991
Planting depth:	30 mm
Plant material:	Seedling cell transplants
Origin:	Sown in greenhouse at Massey University on 13 September 1991

(iv) Trial Details

Design:	Fully randomised complete block
Replicates:	Six
Plot size:	Single row of 25 plants 30 cm apart in the row, 7.5 m long, rows 1.5 m apart, equivalent to 22,000 plants per ha

(v) Harvest details

Year of harvest:	1993	1994	1995
Start date:	5 October	4 October	27 September
Finish date:	4 November	2 November	9 December
Harvest days:	30	30	74
Number of harvests:	25	6	37

4.2 Results

(i) Plant survival and vigour (Table 1)

In four of the cultivars (Taramea, JAG1, JWC1 and CP1), over 90% of the original 25 plants have survived for the four years since the trial was planted. Over 80% of the plants have survived in three other cultivars (Jersey Giant, UC157 and Astora). However, plant loss has been large in Apollo, Atlas and, especially, Pacifica.

Fern growth vigour scores differed among the cultivars with, in general, higher scores for cultivars with better plant survival.

On the basis of both plant survival and fern vigour results, the best cultivars were JAG1, JWC1 and Taramea.

Table 1: Proportions of the original 25 plants surviving in December each year, and fern growth vigour after the 1995 harvest (0 = low vigour, 10 = high vigour).

	Plant survival (%)			
Cultivar	1992	1993	1995	Vigour
Jersey Giant (Syn 4-56)	97	85	82	5.7
UC157	91	85	82	5.0
Taramea	95	93	91	6.3
Astora	93	86	83	5.5
JAG1	96	94	93	7.3
JWC1	94	91	93	6.2
Apollo	85	75	71	5.0
Atlas	87	65	75	4.3
Pacifica	-	-	31	1.3
CP1	95	91	90	4.2
Significance	***	***	***	***
LSD 0.05	9	13	12	1.1
CV (%)	7.9	14.4	13.0	18.9

(ii) Export spear yield (Table 2)

The mean export spear yields for the trial in 1995 were 3220 kg/ha (saleable) and 3880 kg/ha (total, including rejects), or a mean of 83% saleable. There were large differences among the cultivars for all these characteristics.

In descending order, JWC1, JAG1 and Jersey Giant had the highest saleable yields. The yields of all the other cultivars were 1300 kg/ha or more lower than Jersey Giant. The yield of Pacifica was very low because of poor plant survival.

Total export yield followed a similar pattern, although the relative performance of Taramea was better. However, along with JAG1 among the higher yielding cultivars, Taramea had a high yield of reject spears. JWC1 had the highest proportion of saleable export spears of the higher yielding cultivars.

On the basis of export spear yield results, the best cultivars were JWC1 and JAG1.

Table 2: Export spear yields in 1994 (30 day harvest) and 1995 (74 day harvest), and the proportions of export spears that were saleable in 1995.

	Export spear yield (kg/ha)				
	1994	1995			
Cultivar	Total	Saleable	Reject	Total	% Saleable
Jersey Giant (Syn 4-56)	910	4340	900	5240	83
UC157	620	2980	320	3300	90
Taramea	760	3070	1100	4170	74
Astora	380	2530	940	3470	73
JAG1	720	5360	1470	6830	78
JWC1	740	5790	830	6620	88
Apollo	410	2390	530	2920	82
Atlas	410	2670	300	2970	90
Pacifica	60	180	10	190	94
CP1	640	2880	180	3060	94
Significance	***	***	***	***	***
LSD 0.05	300	1040	350	1260	6
CV (%)	45.8	27.7	45.9	27.8	5.9

(iii) Export spear number (Table 3)

Spear numbers followed very similar patterns to the corresponding yields. The mean number of saleable export spears was 15.9/m^2. There were large differences among the cultivars that were related closely to surviving plant numbers.

As for yield, in descending order, JWC1, JAG1 and Jersey Giant had the most saleable export spears. Taramea produced almost as many spears as Jersey Giant, so the mean spear weight for Taramea must have been lower. As for yield, spear number was lower for all the other cultivars.

Total export spear number followed a similar pattern, although the relative performance of Taramea was better. However, along with JAG1 among the higher yielding cultivars, Taramea had a large number of reject spears.

On the basis of export spear number results, the best cultivars were JWC1, JAG1, Jersey Giant and Taramea.

Table 3: Export spear numbers in 1994 (30 day harvest) and 1995 (74 day harvest).

Cultivar	Export spear number (per m^2)			
	1994	1995		
	Total	Saleable	Reject	Total
Jersey Giant (Syn 4-56)	3.8	20.6	4.9	25.5
UC157	3.6	16.3	2.5	18.8
Taramea	4.7	19.7	9.3	29.0
Astora	2.4	15.4	7.4	22.8
JAG1	4.1	21.7	8.1	29.9
JWC1	4.3	25.8	5.9	31.7
Apollo	2.1	11.3	3.0	14.3
Atlas	2.0	10.4	1.7	12.0
Pacifica	0.4	1.1	0.2	1.3
CP1	4.2	17.0	1.6	18.6
Significance	***	***	***	***
LSD 0.05	1.1	4.6	2.1	5.8
CV (%)	28.4	25.0	39.9	24.6

(iv) Total spear yield and number (Table 4)

Total spear yields and numbers were only slightly higher than the export values because undersize spear yields and numbers were very low (mean 105 kg/ha and 2.0/m^2 respectively) and there were no oversize spears.

Among the best cultivars, JAG1 and JWC1 produced the highest total spear yields and numbers. However, JWC1 was the best overall because it had the advantage of a higher proportion of saleable export spears.

Table 4: Undersize and total spear yields and numbers in 1995, and the percent of total yield that was saleable for export.

	Spear yield (kg/ha)		Spear number (per m^2)		
Cultivar	Undersize	Total	Undersize	Total	% Saleable
Jersey Giant (Syn 4-56)	80	5320	1.1	26.6	81
UC157	120	3420	2.3	21.1	87
Taramea	190	4360	3.4	32.4	70
Astora	130	3600	2.0	24.8	71
JAG1	130	6960	2.4	32.2	77
JWC1	110	6730	2.2	33.9	86
Apollo	50	2970	0.9	15.2	80
Atlas	60	3030	1.2	13.2	88
Pacifica	10	200	0.3	1.6	88
CP1	160	3220	3.9	22.4	90
Significance	***	***	***	***	***
LSD 0.05	60	1260	1.2	6.2	7
CV (%)	46.5	27.2	50.6	23.8	7.5

4.3 Conclusions

There were clear performance differences among the cultivars in this trial. The four cultivars that had produced the best yields in the short 1994 harvest (JWC1, JAG1, Jersey Giant and Taramea) were again the best. Among these four in the longer 1995 harvest, JWC1 and JAG1 were clearly ahead of the others. In turn, Jersey Giant was better than Taramea. Apollo, Atlas, Astora and, especially, Pacifica, had the poorest performance.

5 MANAWATU TRIAL

5.1 Trial Information

(i) Cultivars There are 10 cultivars in the trial:

Jersey Giant (Syn 4-56)	UC157
Taramea	Astora
JAG1	JWC1
CRAS25	Apollo
Atlas	Pacifica (CP2)

(ii) Site description

Location:	W. Stiefel, Parewanui Road, Bulls
Soil type:	Peat loam
Paddock history:	Raspberries

(iii) Planting details

Planting date:	12 December 1991
Planting depth:	100 mm
Plant material:	Seedling cell transplants
Origin:	Sown in greenhouse at Massey University on 13 September 1991

(iv) Trial details

Design:	Fully randomised complete block
Replicates:	Six
Plot size:	Single row of 25 plants 30 cm apart in the row, 7.5 m long, rows 1.5 m apart, equivalent to 22,000 plants per ha

(v) Harvest details

Year of harvest:	1993	1994	1995
Start date:	18 September	16 September	25 September
Finish date:	18 October	30 October	13 December
Harvest days:	30	45	80
Number of harvests:	16	32	66

5.2 Results

(i) Plant survival (Table 5)

Plant survival has been generally very good in this trial. In five of the cultivars (Jersey Giant, Astora, JAG1, JWC1 and CRAS25), over 90% of the original 25 plants have survived for the four years since the trial was planted. Over 80% of the plants have survived in four other cultivars (UC157, Taramea, Apollo and Pacifica). Plant loss has been greatest, at 27%, in Atlas.

On the basis of the plant survival results, the best cultivars were Jersey Giant, Astora, JAG1, JWC1 and CRAS25.

Table 5: Proportions of the original 25 plants surviving in December.

Cultivar	Plant survival (%)		
	1993	1994	1995
Jersey Giant (Syn 4-56)	93	93	91
UC157	91	77	83
Taramea	92	90	85
Astora	98	87	98
JAG1	93	93	91
JWC1	98	93	94
CRAS25	93	93	95
Apollo	93	80	86
Atlas	86	75	73
Pacifica	85	78	81
Significance	***	***	***
LSD 0.05	6	9.8	8
CV (%)	5.9	9.8	7.9

(ii) Export spear yield (Table 6)

The mean export spear yields for the trial in 1995 were 4330 kg/ha (saleable) and 4930 kg/ha (total, including rejects), or a mean of 88% saleable. There were large differences among the cultivars for all these characteristics.

In descending order, JWC1, JAG1 and Jersey Giant had the highest saleable yields. The yields of all the other cultivars were 960 kg/ha or more lower than Jersey Giant. UC157, Apollo and Atlas had the lowest yields.

Total export yield followed the same pattern. JAG1 and Astora both had high yields of reject spears. Among the higher yielding cultivars, JAG1 was the only one with a high proportion of reject export spears. On the basis of export spear yield results, the best cultivars were JWC1 and JAG1, with Jersey Giant third at about 15-20% lower.

Table 6: Export spear yields in 1993 (30 day harvest), 1994 (45 day harvest) and 1995 (80 day harvest), and the proportions of export spears that were saleable in 1995.

Cultivar	Export Spear Yield (kg/ha)					
			1995			
	1993 Total	1994 Total	Saleable	Reject	Total	% Saleable
Jersey Giant (Syn 4-56)	470	2510	5500	540	6040	91
UC157	230	970	2570	230	2800	92
Taramea	340	2250	4200	770	4970	85
Astora	280	1770	3820	1150	4970	77
JAG1	540	2950	6470	1220	7690	84
JWC1	390	3040	7060	780	7840	90
CRAS25	150	1810	4540	680	5220	87
Apollo	240	1560	2780	270	3050	91
Atlas	150	1200	2730	240	2970	92
Pacifica	580	1420	3660	120	3780	97
Significance	***	***	***	***	***	***
LSD 0.05	180	460	1070	290	1140	6
CV (%)	46.3	20.4	21.2	41.1	19.8	5.3

(iii) Export spear number (Table 7)

Spear numbers followed very similar patterns to the corresponding yields. The mean number of saleable export spears was 20.8/m^2. There were large differences among the cultivars that were related closely to surviving plant numbers.

As for yield, in descending order, JWC1, JAG1 and Jersey Giant had the most saleable export spears, and they were followed by Taramea. UC157, Apollo and Atlas had the lowest spear numbers.

Total export spear number followed the same pattern. JAG1 and Astora both had high numbers of reject spears, while Pacifica had the fewest.

On the basis of export spear number results, the best cultivars were JWC1, JAG1 and Jersey Giant .

Table 7: Export spear numbers in 1993 (30 day harvest), 1994 (45 day harvest) and 1995 (80 day harvest).

	Export spear number (per m^2)				
			1995		
Cultivar	1993 Total	1994 Total	Saleable	Reject	Total
Jersey Giant (Syn 4-56)	2.0	10.4	25.5	2.3	27.8
UC157	1.1	4.7	13.3	1.4	14.7
Taramea	1.7	11.3	21.8	4.4	26.2
Astora	1.5	8.9	17.9	6.5	24.4
JAG1	2.5	11.4	28.7	5.2	33.9
JWC1	1.8	13.2	31.6	3.7	35.3
CRAS25	0.8	8.9	22.9	4.1	27.0
Apollo	1.1	7.7	13.6	1.6	15.2
Atlas	0.7	5.5	12.8	1.3	14.1
Pacifica	3.0	7.6	19.9	0.8	20.8
Significance	***	***	***	***	***
LSD 0.05	0.9	2.1	4.2	1.4	4.6
CV (%)	49.8	19.7	17.3	38.0	16.6

(iv) Total spear yield and number (Table 8)

In contrast to the Hawke's Bay trial, total spear yields and numbers were considerably higher than the export values, because both undersize and oversize spear yields and numbers were substantial (mean yields 550 and 330 kg/ha respectively). There were large differences among the cultivars.

Among the best cultivars, JAG1 and JWC1 produced the highest total spear yields and numbers; their yields were more than 2000 kg/ha ahead of the next cultivar, Jersey Giant. However, JAG1 and JWC1 both also produced substantial yields of undersize and oversize spears. Overall, JWC1 was the best because it had the advantage of a higher proportion of saleable export spears.

Table 8: Undersize, oversize and total spear yields and numbers in 1995, and the percent of total yield that was saleable for export.

	Spear yield (kg/ha)			Spear number (per m^2)			
Cultivar	Under	Over	Total	Under	Over	Total	% Saleable
Jersey Giant (Syn 4-56)	440	540	7020	5.2	1.2	34.2	78
UC157	400	80	3280	4.6	0.2	19.5	78
Taramea	710	70	5750	7.7	0.3	34.2	73
Astora	880	140	5990	10.8	0.3	35.4	64
JAG1	480	1060	9230	4.9	2.2	41.0	70
JWC1	540	820	9200	6.0	1.7	43.0	77
CRAS25	710	160	6090	7.3	0.4	34.7	75
Apollo	470	230	3750	5.1	0.5	20.8	74
Atlas	380	150	3500	3.8	0.3	18.2	78
Pacifica	440	10	4230	4.7	0.0	25.4	87
Significance	***	***	***	***	***	***	***
LSD 0.05	200	290	1220	2.3	0.6	5.5	7
CV (%)	31.4	76.9	18.1	33.1	67.5	15.3	7.5

(vi) Spear colour (Table 9)

Purple colour was least for UC157 and Pacifica. Scores were in the mid-range of the 1 to 4 scale for all the other cultivars.

Table 9: Mean spear colour scores rated on a scale from 1 (no purple colour) to 4 (heavy purpling) based on observations at each harvest.

Cultivar	Purple Score
Jersey Giant (Syn 4-56)	2.2
UC157	1.2
Taramea	2.1
Astora	2.1
JAG1	2.1
JWC1	2.1
CRAS25	2.3
Apollo	1.9
Atlas	1.8
Pacifica	1.0
Significance	***
LSD 0.05	0.1
CV (%)	4.5

5.3 Conclusions

The best cultivars in this trial in 1995 were JWC1 and JAG1, followed by Jersey Giant. These cultivars had also performed well in the shorter harvests in the previous two years. In the previous years, Taramea had performed well but it was well behind Jersey Giant in 1995. Apollo, Atlas and UC157 had the poorest performance.

6 BAY OF PLENTY TRIAL

6.1 Trial information

(i) Cultivars There are 8 cultivars in the trial:

Jersey Giant (Syn 4-56)	UC157
Taramea	Pacifica
Apollo	Atlas
CRAS24	CRAS25

(ii) Site description

Location:	D. Jones, McDonalds Road, Awakeri, Whakatane
Soil type:	Light soil, ex peat
Paddock history:	1991 vegetables, 1992 pumpkins/melons

(iii) Planting details

Planting date:	14 September 1993
Planting depth:	150 mm
Plant material:	Crowns

(iv) Trial details

Design:	Fully randomised complete block
Replicates:	Five
Plot size:	Single row of 25 plants 30 cm apart in the row, 7.5 m long, rows 1.5 m apart, equivalent to 22,000 plants per ha

(v) Harvest details

Year of harvest:	1994	1995
Start date:	2 September	18 September
Finish date:	15 September	8 October
Harvest days:	13	21
Number of harvests:	8	18

6.2 Results

(i) Plant survival (Table 10)

Plant survival has been good so far in this trial, with most plants still present in all cultivars except Atlas which has suffered significant loss of plants.

Table 10: Proportions of the original 25 plants surviving in December.

	Plant Survival (%)		
Cultivar	1993	1994	1995
Jersey Giant (Syn 4-56)	99	95	99
UC157	97	94	97
Taramea	99	92	99
Pacifica	96	90	96
Apollo	95	90	95
Atlas	88	85	88
CRAS24	97	95	97
CRAS25	98	92	98
Significance	***	***	***
LSD 0.05	4	7	4
CV (%)	3.3	5.9	3.5

(ii) Export spear yield (Table 11)

The mean export spear yields for the trial in 1995 were 580 kg/ha (saleable) and 890 kg/ha (total, including rejects), or a mean of 65% saleable. There were large differences among the cultivars for all these characteristics.

In descending order, Jersey Giant, CRAS25, UC157 and Pacifica had the highest saleable yields, but all were less than 1000 kg/ha. Atlas and CRAS24 had the lowest yields.

Total export yield was highest for Jersey Giant and Taramea, but both had high reject percentages.

Table 11: Export spear yields in 1994 (13 day harvest) and 1995 (21 day harvest), and the proportions of export spears that were saleable in 1995.

	Export Spear Yield (kg/ha)				
		1995			
Cultivar	1994 Total	Saleable	Reject	Total	% Saleable
Jersey Giant (Syn 4-56)	200	880	480	1360	65
UC157	300	680	150	830	82
Taramea	150	560	500	1060	53
Pacifica	410	670	140	810	83
Apollo	140	480	290	770	62
Atlas	60	300	170	470	64
CRAS24	80	390	480	870	45
CRAS25	130	700	280	980	72
Significance	***	***	***	***	***
LSD 0.05	90	170	190	290	12
CV (%)	2.9	23.1	46.5	25.4	14.0

(iii) Export spear number (Table 12)

The mean numbers of saleable and total export spears were 3.0 and 4.5 per m^2 respectively. Spear numbers followed very similar patterns to the corresponding yields.

(iv) Total spear yield and number (Table 13)

Undersize and oversize spear yield and number, and therefore the proportion of total yield that was saleable for export, differed substantially among cultivars. Atlas and Taramea had the highest reject yields, but the lowest and highest numbers of reject spears respectively. This occurred because Atlas had a few oversize spears while Taramea had many undersize ones. The percent of total yield saleable for export was highest for Pacifica, Jersey Giant and UC157.

(v) Spear colour, fern height, vigour and green scores (Table 14)

The range of spear colour scores was small. Pacifica and UC157 were the greenest while several cultivars had similar purple colour scores at the other end of the range.

Fern vigour was highest for Jersey Giant and Taramea and lowest for CRAS25 and Atlas. Fern height ratings differed from vigour. Jersey Giant and Atlas were the tallest while CRAS24 and Taramea were the shortest. Fern greenness ratings were highest for Jersey Giant and UC157 and lowest for Taramea, Pacifica and CEAS24.

Table 12: Export spear numbers in 1994 (13 day harvest) and 1995 (21 day harvest), and the proportions of export spears that were saleable in 1995.

	Export spear number (per m^2)				
		1995			
Cultivar	1994 Total	Saleable	Reject	Total	% Saleable
Jersey Giant (Syn 4-56)	0.9	4.7	2.1	6.8	69
UC157	1.3	3.4	0.8	4.1	81
Taramea	0.8	3.3	2.8	6.1	54
Pacifica	1.6	3.2	0.6	3.8	84
Apollo	0.5	2.3	1.3	3.7	64
Atlas	0.2	1.3	0.7	2.0	66
CRAS24	0.5	2.1	2.3	4.4	48
CRAS25	0.7	3.7	1.5	5.3	71
Significance	***	***	***	***	***
LSD 0.05	0.4	0.9	0.9	1.4	13
CV (%)	16.9	22.8	47.4	24.1	14.5

Table 13: Undersize, oversize and total spear yields and numbers in 1995, and the percent of total yield that was saleable for export.

Cultivar	Spear Yield (kg/ha)			Spear Number (per m^2)			% Saleable
	Under	Over	Total	Under	Over	Total	
Jersey Giant (Syn 4-56)	60	120	180	1.0	0.3	8.1	58
UC157	120	30	150	1.7	0.1	5.9	57
Taramea	270	30	300	4.3	0.1	10.5	32
Pacifica	90	60	150	1.3	0.2	5.3	61
Apollo	80	70	150	1.1	0.2	5.0	47
Atlas	40	310	350	0.5	0.7	3.2	41
CRAS24	140	40	180	2.2	0.1	6.6	32
CRAS25	120	20	140	1.7	0.1	7.1	53
Significance	***	***	***	***	***	***	***
LSD 0.05	60	100	120	0.9	0.3	1.6	11
CV (%)	37.1	95.6	46.1	39.4	88.4	18.9	18.3

Table 14: Spear colour (0 = green, 4 = purple), fern vigour (0 = low, 10 = high), fern height (0 = short, 10 = tall) and fern greenness scores (0 = low, 10 = high).

Cultivar	Spear colour	Fern vigour	Fern height	Fern greenness
Jersey Giant (Syn 4-56)	1.3	7.2	8.0	4.6
UC157	0.8	5.2	7.0	3.6
Taramea	1.4	6.8	4.4	1.0
Pacifica	0.6	6.0	6.0	1.8
Apollo	1.3	4.8	6.8	2.6
Atlas	1.0	4.4	7.6	3.6
CRAS24	1.3	4.6	3.6	1.8
CRAS25	1.4	4.0	5.4	2.6
Significance	NS	***	**	***
LSD 0.05	0.8	1.0	2.4	1.1
CV (%)	51.3	12.7	30.5	30.7

6.3 Conclusions

The 1995 harvest of this trial was short and yields were low. Therefore, no firm conclusions are possible about the relative merits of the cultivars in the trial. More results are needed from further harvests before reliable cultivar comparisons will be possible from this trial.

7 WAIKATO TRIAL

7.1 Trial Information

(i) Cultivars There are 18 cultivars in the trial:

Jersey Giant (Syn 4-56)	UC157
Taramea	Pacifica
Apollo	Atlas
Franklin	Jersey Jewel
Grande	JWC1
Largo 17-3	Jersey Giant
Largo 42-2	Jersey Giant (Syn 4-362)
Jersey General	Jersey King
Jersey Prince	CP3

(ii) Trial details

Location:	B. and H. Eliot, Hinuera
Planting date:	Spring 1994
Design:	Fully randomised complete block
Replicates:	Four
Plot size:	Single row of 25 plants 30 cm apart in the row, 7.5 m long, rows 1.5 m apart, equivalent to 22,000 plants per ha

(v) Harvest details

Year of harvest:	1995
Start date:	22 September
Finish date:	6 October
Harvest days:	15
Number of harvests:	8

7.2 Results

The 1995 harvest of this trial was the first, and it was only 15 days long. The results in Table 15 are the totals from the eight harvests in the period. Data from individual plots and harvest dates were not provided so no statistical analyses were possible.

Spear yields were low, with a mean total yield of only 650 kg/ha. Total yields ranged from 50-2960 kg/ha, and saleable export yields from 50-2660 kg/ha. Spear numbers followed similar trends to the yields.

Pacifica had a much higher yield than all other cultivars. Apparently it has a lower temperature threshold and, therefore, starts spear production earlier in spring. Some of the later cultivars had barely started producing spears when the harvest ended. After Pacifica, Taramea and UC157 were the best cultivars.

7.3 Conclusions

This was a very short harvest and yield differences seemed to be influenced by temperature threshold differences among cultivars. More results are needed from further harvests before reliable cultivar comparisons will be possible from this trial.

Table 15: Spear yields and numbers from the 15 day harvest in 1995.

	Spear yield (kg/ha)					Spear number (per m^2)				
Cultivar	Saleable export	Reject export	Undersize	Oversize	Total	Saleable export	Reject export	Undersize	Oversize	Total
Syn 4-56	720	50		50	820	2.6	0.3	0.0	0.1	3.0
UC157	880	90	50	30	1050	3.5	0.4	0.6	0.1	4.6
Taramea	930	440	90		1460	5.3	2.8	1.2	0.1	9.4
Pacifica	2660	90	210		2960	13.5	0.4	1.7		15.6
Apollo	440	50	10	50	550	1.5	0.2	0.1	0.1	1.9
Atlas	650				650	2.1				2.1
Franklin	80	30			110	0.3	0.1			0.4
Jersey Jewel	210		60		270	1.2		0.7		1.9
Grande	380	40			420	1.2	0.2			1.4
JWC1	230	40	10		280	1.3	0.3	0.1		1.6
Largo 17-3	330	40	10	50	430	1.3	0.2	0.1	0.1	1.7
Jersey Giant	220		20		240	0.9		0.4		1.3
Largo 42-2	820	70	10		900	3.2	0.4	0.1		3.7
Syn 4-362	50				50	0.2				0.2
Jersey	110		10		120	0.4		0.1		0.5
Jersey King	390	30			430	1.2	0.2	0.1		1.5
Jersey Prince	230		40		410	1.1		0.1		1.2
CP3	520		180		520	3.4		2.2		5.6

8 CONCLUSIONS

In 1995, full-length harvest results were obtained only in the Hawke's Bay and Manawatu trials. The four cultivars that had produced the best yields in the shorter 1994 harvest (JWC1, JAG1, Jersey Giant and Taramea) were again the best in both trials. Among those four, JWC1 and JAG1 were clearly ahead of the others. In turn, Jersey Giant was better than Taramea. Atlas, Astora, Apollo and, especially, Pacifica had the poorest performance in Hawke's Bay. In Manawatu, Apollo, Atlas and UC157 had the lowest yields.

The harvests in the Bay of Plenty and Waikato trials were only 21 and 15 days long, and more results are needed from further harvests before reliable cultivar comparisons will be possible.

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