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National asparagus cultivar trial no. 3

—results of the 1996 harvest

A report prepared for the

New Zealand Asparagus Council

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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. Originally there were six trials in the series but only two were harvested in 1996, one each in the Bay of Plenty and Waikato. Of the other four, one in South Canterbury was abandoned after the 1994 harvest due to poor plant survival and, after successful harvests in 1994 and 1995, the New Zealand Asparagus Council decided not to harvest the trials in Hawke's Bay and Manawatu in 1996. The results from the Waikato site are being reported separately by the local growers' association. This report presents results from the 1996 spear harvest at the site in the Bay of Plenty. It was planted in spring 1993 and harvested for the third time in 1996. It was harvested daily from 14 September to 12 November (59 days).

Jersey Giant was clearly the best cultivar. It had a much higher total yield (4070 kg/ha) than all the others, and it also had the highest proportion of saleable spears (66%, 2670 kg/ha). Of the other cultivars, CRAS25 was the most promising (total yield of 2390 kg/ha, 53% of which was saleable (1270 kg/ha)). Taramea produced a similar total yield to CRAS25, but its saleable yield was similar to all the other lower-ranked cultivars. At the other end of the range, UC157 and Pacifica had the lowest yields (totals less than 1300 kg/ha). Along with Taramea and CRAS24, UC157 also had a low proportion of yield that was in the saleable category because it produced a lot of undersize spears. In all cases, spear numbers followed very similar patterns to the corresponding yields.

Even though it was the third harvest season, yields were low. However, they were generally about twice as high as in 1995 and cultivar rankings were similar in the two years. This suggests that the comparisons among cultivars have become more reliable.

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 the 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. After successful harvests in 1994 and 1995, the New Zealand Asparagus Council (NZAC) decided not to harvest the Hawke's Bay and Manawatu trials in 1996. Only the Bay of Plenty and Waikato trials were harvested.

The Waikato results are being reported separately. Therefore, this report presents results from the 1996 harvest of only one trial in the Bay of Plenty.

3 METHODS

The trial is managed and harvested by D Jones at Awakeri. It was planted as crowns in September 1993, and consists of 40 plots in a randomised complete block design with five replicates of eight cultivars. Each plot is a single row of 25 plants, 30 cm apart in the row, rows 7.5 m long and 1.5 m apart, equivalent to 22 200 plants per ha. The cultivars are:

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

The trial was harvested for short periods in the previous two years (13 and 21 days in 1994 and 1995 respectively). In 1996, it was harvested daily from 14 September to 12 November (59 days). At the end of the season, daily hand-recorded harvest results were sent to Crop & Food Research on data sheets provided at the start of the season.

The results were entered into a Quattro-Pro spreadsheet and collated into spear yield and spear number categories as shown in the tables of results in the following section. 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 5% 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, and

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

4 RESULTS

4.1 Spear yield

The overall yield level of the trial was quite low (Table 1, Fig. 1). Total yield averaged about 2000 kg/ha, and the range among cultivars was from about 1200 to 4000 kg/ha. Saleable export yield varied among cultivars from about 600 to 2700 kg/ha, with a mean of almost 1100 kg/ha. The proportion of total yield that was saleable ranged from 39 to 66%.

Jersey Giant was the best cultivar. It had a much higher total yield than the others, and it also had the highest proportion of saleable spears. Of the other cultivars, CRAS25 was the most promising. At the other end of the range, UC157 and Pacifica had the lowest yields. Along with Taramea and CRAS24, UC157 also had a low proportion of yield that was in the saleable category because it produced a lot of undersize spears.

Yields were generally about twice as high as in 1995. However, cultivar rankings were similar in the two years. Exceptions were that Atlas improved while UC157 and Pacifica dropped.

4.2 Spear number and colour

In all cases, spear numbers followed very similar patterns to the corresponding yields (Table 2). Spear number per m^2 was highest for Jersey Giant (18.8 total, 13.2 saleable) and lowest for Atlas, UC157 and Pacifica (about 6-7 total and about 4 saleable).

On average, Taramea, UC157 and CRAS24 had smaller spears, and produced more undersize ones, while Jersey Giant and Atlas had larger spears than the other cultivars.

The range of spear colour scores was small. Pacifica and UC157 were the greenest, and there was little difference among the other cultivars.

Table 1: Spear yields (kg/ha).

Cultivar	1994 total export	1995 total export	1996						
			Export						
			Total	Saleable	Reject	Oversize	Undersize	Total	% Saleable
Jersey Giant (Syn 4-56)	200	1360	3670	2670	1000	120	280	4070	66
CRAS25	130	980	1930	1270	660	10	450	2390	53
Taramea	150	1060	1440	860	580	0	850	2290	38
Apollo	140	770	1320	930	390	20	360	1700	55
CRAS24	80	870	1140	640	500	0	480	1620	39
Atlas	60	470	1250	870	380	140	180	1570	55
UC157	300	830	710	570	140	0	570	1280	44
Pacifica	410	810	980	820	160	0	270	1250	66
Signif.	***	***	***	***	***	**	***	***	***
LSD 0.05	90	290	630	460	290	80	140	690	8
CV (%)	2.9	25.4	31.4	32.6	47.2	179	26.0	26.2	12.3

* = significant at the 5% level of probability.

** = significant at the 1% level of probability.

*** = significant at the 0.1% level of probability.

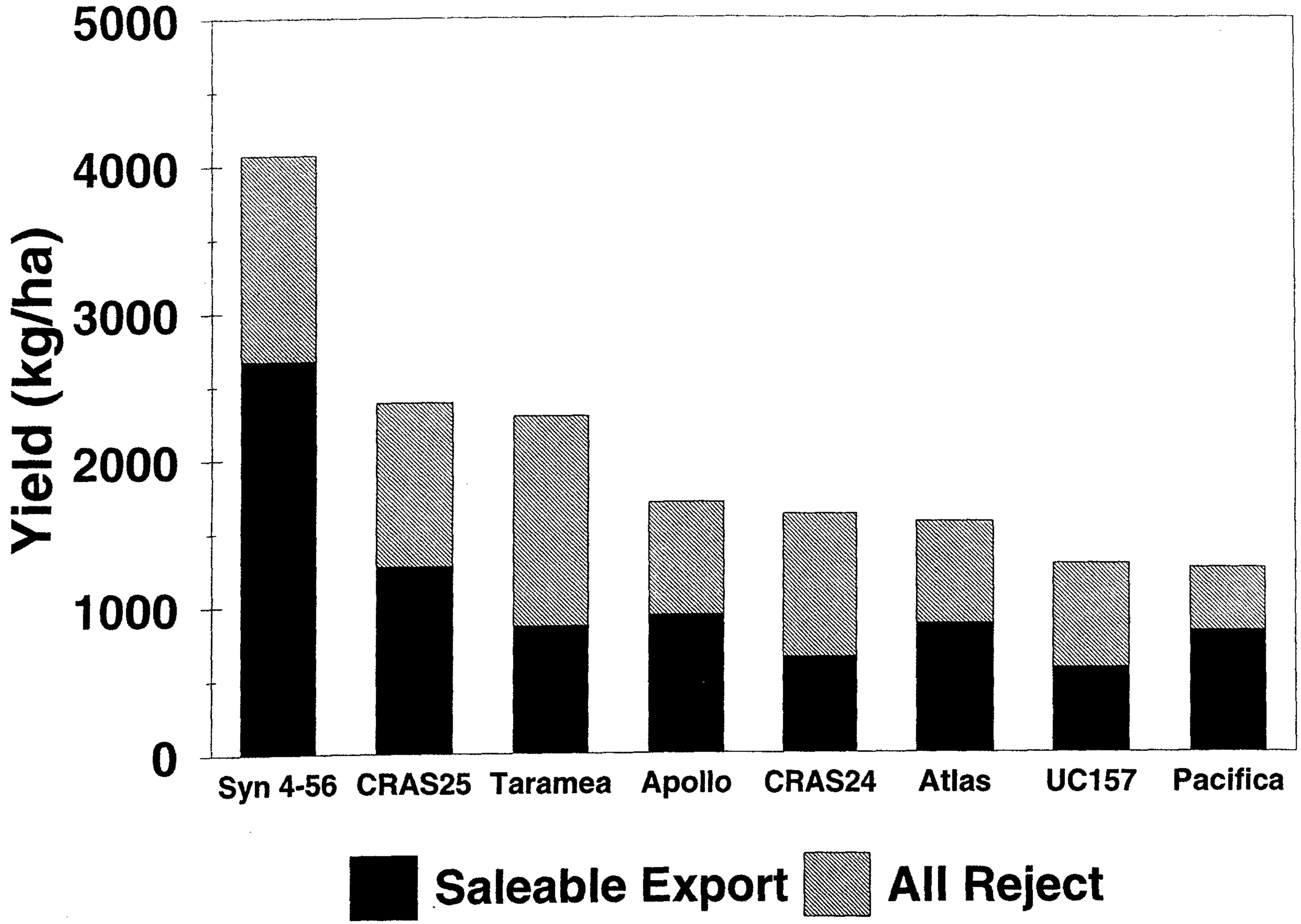

Figure 1: Marketable and reject spear yields for the eight cultivars.

Table 2: Spear numbers (per m^2) and colour scores.

			1996						
			Export						
Cultivar	1994 total export	1995 total export	Total	Saleable	Reject	Oversize	Undersize	Total	Colour score[1]
Jersey Giant (Syn 4-56)	0.9	6.8	17.6	13.2	4.4	0.3	0.9	18.8	1.4
CRAS25	0.7	5.3	10.8	7.4	3.4	0.1	1.7	12.6	1.8
Taramea	0.8	6.1	9.4	5.7	3.7	0.0	4.3	13.7	1.4
Apollo	0.5	3.7	6.7	5.0	1.7	0.1	1.1	7.9	1.1
CRAS24	0.5	4.4	6.7	3.9	2.8	0.0	2.2	8.9	1.6
Atlas	0.2	1.3	6.0	4.3	1.7	0.3	0.5	6.8	1.1
UC157	1.3	4.1	4.5	3.7	0.8	0.0	1.7	6.2	0.8
Pacifica	1.6	3.8	5.5	4.7	0.8	0.0	1.3	6.8	0.0
Signif.	***	***	***	***	***	***	***	***	***
LSD 0.05	0.4	1.4	3.1	2.3	1.3	0.2	0.9	3.5	0.7
CV (%)	16.9	24.1	28.1	30.0	42.4	159	39.4	26.3	45.8

[1] Colour scores: 0 = green, 4 = purple.

* = significant at the 5% level of probability.

** = significant at the 1% level of probability.

*** = significant at the 0.1% level of probability.

5 CONCLUSIONS

Even though it was the third harvest season, the trial was only harvested for 59 days and yields were low. Variations in yield were relatively high. However, the ranking of cultivars remained similar to the two previous seasons when the harvests were much shorter. This suggests that the comparisons among cultivars have become more reliable.

As in 1995, Jersey Giant was clearly the best cultivar, with about twice the yield of the second ranked CRAS25. Taramea produced a similar total yield to CRAS25, but its saleable yield was similar to all the other lower-ranked cultivars.

6 ACKNOWLEDGEMENTS

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