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SITE VARIATIONS IN PERCENTAGE OF SALEABLE YIELD OF ASPARAGUS

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ABSTRACT

The percentage of saleable yield from asparagus grown at Alexandra, Central Otago was much lower than that grown at Flock House, Manawatu, a site producing yields typical of most other asparagus growing areas in New Zealand. The difference was apparent even when air temperatures were similar at both sites, spear lengths at harvest were nearly the same, and harvesting was being done at the same stage of the season. Environmental factors, not yet identified, operating before the harvest season began, rather than those operating during the harvest season, may have been responsible for the differences in percentage saleable yield at the two sites.

Additional Key Words: environmental factors, harvest season, pre-harvest season.

INTRODUCTION

After harvesting asparagus cultivars for the 1983, 1984 and 1985 seasons, it was found that the percentages of saleable yields were much lower for crops grown in Central Otago than for crops grown in most other districts (Bussell **et al.**, 1985; Brash and Bussell, 1986). These differences could affect returns to growers and the economic viability of asparagus production in certain areas of New Zealand. The differences between sites were not able to be explained, and similar differences in quality have not been reported overseas.

In 1986 a further attempt was made to find the reasons for the differences in saleable yield and the cultivars UC157 and Jersey Giant grown at Alexandra, (Central Otago), and at Flock House, (Manawatu) were harvested and analysed. Previously, the percentage of the yield deemed saleable at Flock House had been much higher than at Alexandra, and of the many cultivars recorded at both sites, UC157 and Jersey Giant had produced among the highest percentages of saleable yield (Bussell *et al.*, 1985; Brash and Bussell, 1986).

MATERIALS AND METHODS

In 1986 harvesting was carried out three times a week (Monday, Wednesday and Friday) over an 80 day season at both sites. At Alexandra recordings were made during weeks 2 and 3, weeks 6 and 7, and weeks 10 and 11. At Flock House, recordings were made throughout the season, except for the first two weeks. The total weight of untrimmed spears and the weight of saleable processing grade spears were recorded. Saleable spears were straight, of at least 10 mm, basal diameter and had unopened bracts, and were trimmed to 180 mm length before weighing. The percentage of the yield considered to be saleable was calculated from these two weights. Spear height was recorded at each harvest at Alexandra and irregularly at Flock House.

Hourly air temperatures recorded by thermograph at the meteorological stations at the DSIR Research Orchard near Clyde (I59235) and at Ohakea (E05231) were used to indicate air temperatures at the Alexandra and Flock House sites. Both meterological stations were about 4 km from the trial sites and had similar aspect and altitude. Heat units were calculated as degree hours above 5^0C, because this temperature appears to limit spear growth in asparagus (Nichols and Woolley, 1985).

RESULTS AND DISCUSSION

In the 1986 season, the percentage of saleable yield of both cultivars remained similar over the nine week recording period at Flock House (Table 1). At Alexandra the percentage of saleable yield of Jersey Giant was similar in the three recording periods, but much lower than at Flock House (Table 1). The percentage of saleable yield for UC157 grown at Alexandra was significantly lower at the end of the season than earlier, and always less than for this cultivar grown at Flock House (Table 1). Even when temperatures at both sites were similar during the same stage of the harvest season (weeks 6, 7, Table 1) and spear height at Alexandra (Table 1) and Flock House (235 mm to 260 mm from intermittant recording) were similar, the difference in the percentage of saleable yield obtained at the two sites was maintained.

The percentage of saleable yield from UC157 and Jersey Giant harvested at Alexandra and Flock House in the 1986 season was not significantly correlated with harvest season air temperature. In the 1983, 1984 and 1985 seasons at Alexandra the percentage of saleable yield was also not correlated with air temperatures over the harvest season (Brash and Bussell, 1986). This was surprising because air temperature has been shown to affect both spear emergence (e.g. Bouwkamp and McCully, 1975) and growth (e.g. Tiedjens, 1924).

Because the percentage of saleable yields of both cultivars at each site were quite different when temperatures and spear length at harvest were similar, and because percentages generally remained similar in each treatment throughout the harvest season (Table 1), environmental factors operating before the harvest season began may also be contributing to differences in percentage of saleable yield at the two sites. These could include those operating in the main period of bud formation during fern growth, such as drought (Robb, 1984), or those operating when the asparagus plant is dormant, such as winter chilling.

Studies on the effect on percentage of saleable yield of environmental factors operating before the harvest season begins

Table 1. Percentage of saleable spears in UC157 and Jersey Giant (JG), accumulated degree hours above 5^{0}C at Alexandra and Flock House and spear height (mm) at harvest at Alexandra in each recording week of the 1986 season.

	Alexandra					Flock House		
Week of season	Degree hours	% saleable spears UC157	JG	Spear height UC157	JG	Degree hours	% saleable spears UC157	JG
1	-	-	-	-	-	-	-	-
2	1083	27.9±2.7	14.1±3.1	200	21	-	-	-
3	1065	35.3±10.2	17.4±2.8	246	229	1304	68.5±4.6	72.3±10.5
4	-	-	-	-	-	1333	68.9±5.2	62.5±6.9
5	-	-	-	-	-	1272	72.8±4.0	80.2±1.2
6	1352	44.5±15.6	15.7±3.3	232	255	1494	76.2±4.4	80.6±3.4
7	1792	28.7±13.4	7.6±0.6	283	281	1564	79.5±4.2	74.9±3.0
8	-	-	-	-	-	1728	72.8±7.8	74.1±4.5
9	-	-	-	-	-	1234	68.5±9.4	75.3±5.9
10	2055	11.5±13.6	10.4±2.1	280	282	1567	79.4±9.7	79.9±7.2
11	2334	5.2±11.0	7.2±2.1	360	367	1201	79.9±15.3	84.4±4.7

are being carried out at present (A.R. Robb, pers. comm.). The results from these studies may help growers estimate more accurately future yields of current crops and assist in determining suitable areas for growing asparagus in the future.

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