

FV 183 - PRACTICAL SECTION FOR GROWERS

Commercial Benefit of the Project

There is an increasing demand for asparagus and this is being met by a continuing influx of new growers and expansion by some existing growers.

Asparagus crops are very expensive to establish. Cultivar selection is the most important decision growers make in establishing an asparagus crop. Decisions made at this stage have a marked effect on profitability for the following 10-15 years.

It is therefore to the growers' advantage to establish a cultivar that will produce economic yields of a grade that will satisfy today's demanding market specifications. The cultivars should also be capable of a high cropping performance for many years. The results of this work will influence UK growers' decisions on cultivar selection for the foreseeable future.

Background and Objectives

The last cultivar trial established in the UK was in 1986. As no breeding programme is in operation in the UK, cultivars developed in other countries need to be trialled on a regular basis.

This trial evaluated cultivars from Holland, France, USA, New Zealand, Denmark, Italy and Germany. It was considered that cultivars that were bred outside Europe in countries with a similar climate to that of the UK such as New Zealand and New Jersey/USA could have potential for performing well under UK conditions.

The results of this project will be comparable with a similar collection of cultivars trialled in other countries as part of the Second International Asparagus Cultivar Trial Project.

The trial was established on a commercial asparagus farm in Norfolk in June 1995. Twenty cultivars have been assessed, three of which are common to all trial sites in the world that are connected with the project.

Summary of results

By the autumn of 1995 the trial planted with container raised transplants had established very well with the aid of several irrigation applications. There were no plant losses.

Plant survival rates were assessed in September of each year 1996-2000 inclusive. By 2000, the Dutch cultivars had the highest plant survival rate with every cultivar over 96%. The lowest survival rates were recorded with the USA cultivars UC157, Purple Passion and Atlas with 50.6%, 56.9% and 61.3% respectively.

Vigour assessments were made in September of each year 1996-2000 inclusive. Vigour scores in 2000 were generally similar to those recorded in previous years. The Dutch cultivars have consistently been the most vigorous. Atlas and Eros have produced high vigour levels. JWC1, Jacq ma 2004 and Jacq ma 2014 were the least vigorous. However, crop vigour is not always an accurate way of determining cultivar potential.

An assessment was made for the incidence of purple spot (*Stemphylium vesicarium*) in September of each year 1996-2000 inclusive. Generally low levels were recorded in 1996 and

1997, but moderate to high levels were recorded on all cultivars in 1998, and moderate levels were recorded in 1999 on all cultivars, with very low levels in 2000.

Rust is not generally a problem on UK asparagus crops. However in 1997 it was seen on a number of commercial crops and was recorded on all cultivars in this trial. Assessments were made in September 1998, 1999 and 2000, and no rust was recorded on any of the cultivars in the trial in these years.

Records of foliage greenness were taken on ten occasions late in the growing seasons of 1998, 1999 and 2000. Early foliage deterioration was recorded on the cultivars Aarslev 270, Carlim and Vulcan. Some cultivars maintained green foliage into November. However green foliage late in the growing season is not necessarily a reliable indicator in determining potential production of a cultivar.

Today's market demands asparagus spears of up to 23cms long with a tight bud. Temperature has an influence on the ability of cultivars' spears to hold a tight bud. High temperatures encourage the buds of most cultivars to open. Records were taken of bud tightness on 30 May 1997, some 10 days after the termination of harvesting, and after a period of several days at a similar temperature. Tightness was assessed on spears at 25cms above soil levels. The Californian bred cultivars Purple Passion and UC157 had the tightest buds. The European bred cultivars Aarslev 270, Boonlim, Carlim, Horlim, Jacq ma 2004 and Vulcan had the most open buds.

1997 - Harvest data

Harvest data was collected for the first time in 1997. The harvesting season began earlier than normal, with the spears of the earliest cultivars being harvested on 19 April. Harvesting of all cultivars was terminated on 21 May. There were large differences between cultivars for numbers of spears ('00/ha) and yield (t/ha). Geynlim produced a higher yield than all the other cultivars. Carlim, Vulcan, Jacq ma 2004 and Andreas produced high yields of blown and twisted spears. Tarama produced a particularly high yields of spears below 10mm diameter. Geynlim had a higher yield than all other cultivars in the above 10mm diameter.

1998 - Harvest data

Harvest data was collected for a full season in 1998 between 2 May and 20 June. There were large differences between cultivars for numbers of spears ('000/ha) and yield (t/ha). Carlim, Franklim and Tarama produced the highest total number of spears and Purple Passion the least. Geynlim produced the highest total yield followed by Carlim and Venlim. The cultivars Purple Passion and UC157 gave the lowest total yield.

Jacq ma 2004, Aarslev 270 and Franklim produced the highest number of blown and twisted spears and Purple Passion the least. Jacq ma 2004 produced a significantly higher yield ($p < 0.001$) of blown and twisted spears with Purple Passion, UC157 and Atlas producing the least. Geynlim and Carlim produced the highest number of spears above 10mm diameter and Geynlim the highest yield in this size category.

Franklim, Tarama and Carlim produced the highest number of spears and yield below 10mm diameter. Boonlim produced the lowest number of spears and yield in this size category.

1999 - Harvest data

Harvest data was collected for the second full season in 1999 between 16 April and 21 June. There were significant differences ($p < 0.001$) between cultivars for total number of spears. Carlim, Geynlim and Franklim produced a particularly high number of spears and Purple Passion and Atlas produced the lowest total number of spears. There were large differences ($p < 0.001$) between cultivars for total yield. Geynlim and Carlim produced the best total yields and Atlas, UC157 and Purple Passion gave the lowest total yield.

Carlim and Jacq ma 2004 produced the highest number of blown and twisted spears and Purple Passion produced the least. Venlim produced the highest yield of blown and twisted spears and Purple Passion, UC157 and Atlas produced the lowest yield.

Tarama and Carlim produced the highest yield of spears below 10mm diameter and Eros and Boonlim the lowest. Tarama produced the highest number of spears below 10mm diameter and Boonlim and Eros produced the lowest number in this size grade.

Carlim produced the most spears above 10mm diameter and UC157 and Atlas produced the least number. Geynlim produced the highest yield of spears above 10mm diameter and UC157 and Atlas the lowest yield in this size category.

2000 - Harvest data

Harvest data was collected for the third full season in 2000 between 3 May and 23 June. There were significant differences ($p < 0.001$) between cultivars for total numbers of spears. Carlim and Geynlim produced the highest number of spears. Carlim, Geynlim and Franklim produced the highest total yields and UC157 and Atlas produced the lowest total yields.

Carlim, Franklim and Vulcan produced the highest number of blown and twisted spears and UC157 and Purple Passion produced the lowest number. Carlim produced the highest yield of blown and twisted spears and UC157 and Atlas the lowest.

Carlim produced the highest number of spears below 10mm diameter and Jacq ma 2004 the lowest number. Franklim and Carlim produced the highest yield of spears below 10mm diameter and Jacq ma 2004 and UC157 the lowest yield.

Geynlim and Carlim produced the highest number of spears above 10mm diameter and UC157 the lowest number. Geynlim produced the highest yield of spears above 10mm diameter and UC157 the lowest yield.

Cumulative numbers of spears and yield 1997-2000

There were statistically significant differences between cultivars for both numbers and yields of spears.

The Dutch cultivars Geynlim and Carlim produced the highest cumulative yield during the period 1997 to 2000.

The lowest performers for cumulative data were the USA (Californian) cultivars Purple Passion, UC157 and Atlas.

Summary

During the period of this trial (1995-2000) differences between cultivars have been recorded. The Dutch cultivars are producing the highest total and cumulative yields, whereas the Californian bred cultivars UC157, Atlas and Purple Passion are producing very disappointing and unacceptable yields. This is not surprising as they have been bred for hot and dry conditions, unlike the cool/temperate climate of the UK.

The Dutch cultivars produce acceptable bud tightness under warm conditions, but buds open quite readily when temperatures rise above 25°C. Of these cultivars Venlim produced the tightest buds. The Californian cultivars all maintain tight buds at high temperatures.

Andreas is the best performing French cultivar. The New Zealand cultivars are producing disappointing yield data. Of the other European cultivars, Vulcan is producing the best yield performance.

Plant survival rates are variable, with the eight Dutch cultivars maintaining over 96% plants after five years. By the end of 2000 the USA cultivars were recording low survival rates at between 50% and 61%.

Details of other trials connected with the Second International Asparagus Trial of which this trial forms a part are presented towards the end of this report in Appendix 1.

Cautionary note

Whilst yield data collected for a short period in 1997 and for the first full seasons in 1998, 1999 and 2000 may suggest a preference for a particular cultivar, it must be remembered that this trial is still in its relative infancy. Therefore until at least another three years harvest data has been collected and presented it will not be possible to reliably make a decision on a cultivar's preference. There is a likelihood that HDC will request results after a three year period.

Action points for growers

With only a short harvesting period in 1997 and the first full seasons in 1998, 1999 and 2000, the Dutch cultivars Geynlim and Carlim are producing the best yields. However it is not possible to reliably recommend any cultivars for their long term sustainability and performance, although there are indications as to the best and worst performing cultivars as detailed above.

Anticipated Practical financial benefits

It is too early to draw reliable benefits from this project. During the period 1999-2000 inclusive, the data collected on yield and grade performance, disease sensitivity and the ability of cultivars to survive and perform under UK conditions is becoming apparent. More reliable information on the longevity and financial viability of the cultivars in this trial, will be gained if the trial is allowed to continue for at least three more years.