

Project Number : **FV 183a**

Project Title : **Asparagus : Cultivar Evaluation**

Project Leader : **W J Dyer, ADAS Horticulture
The Old Market Office, 10 Risbygate Street,
Bury St Edmunds, Suffolk IP33 3AA**

Report : **Final Report (November 2002)**

Previous Reports : **December 1995, 1996, 1997, 1998,
1999 and 2000**

Key Worker : **W J Dyer, ADAS Horticulture**

Location of Project : **Portwood Farm, Great Ellingham,
Nr Attleborough, Norfolk**

Project Co-ordinator : **Mr H V Aveling,
Chairman, Asparagus Growers Association
Badgeney Lodge, Badgeney End, March,
Cambs PE15 ODD**

Date Project commenced : **1st October 2002**

Date Project Completed : **30 November 2002**

Key words : **Asparagus, cultivar, vigour, fern numbers,
variety**

Whilst reports issued under the auspices of the HDC are prepared from the best available information, neither the authors nor the HDC can accept any responsibility for inaccuracy or liability for loss, damage or injury from the application of any concept or procedure discussed.

The contents of this publication are strictly private to HDC members. No part of this publication may be copied or reproduced in any form or by any means without prior written permission of the Horticultural Development Council.

The results and conclusions in this report are based on an investigation conducted over one year. The conditions under which the experiments were carried out and the results obtained have been reported with detail and accuracy. However, because of the biological nature of the work it must be borne in mind that different circumstances and conditions could produce different results. Therefore, care must be taken with interpretation of the results, especially if they are used as the basis for commercial product recommendations.

Report compiled by :-

W J Dyer
Senior Horticultural Consultant
ADAS Horticulture
Bury St Edmunds

Signature :

Date :

Report Authorised by:-

Dr T M O'Neill
Horticulture Research Manager
ADAS Arthur Rickwood

Signature :

Date :

CONTENTS

	Page No.
GROWER SUMMARY	1
Commercial Benefit Of The Project	1
Background and Objectives	1
Summary of Results and Conclusions	2
Action Points for Growers	3
Anticipated Practical and Financial Benefit	3
SCIENCE SECTION	4
Introduction	4
Objective	4
Materials and Method	4
- Site	4
- Treatments – cultivars	4
- Husbandry	5
- Assessments	5
- Design and analyses	6
Results and Discussion	7
Conclusions and Recommendations	11

GROWER SUMMARY

Headline

Eight Dutch, one French and one new Jersey cultivars have shown promising growth characteristics and have been selected for further evaluated in 2003.

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.

This project has identified the key cultivars for future monitoring of production performance.

Background and Objectives

The HDC funded a cultivar trial of 20 cultivars selected from Holland, France, USA, New Zealand, Denmark, Italy and Germany during the period 1995-2000. During the same period ADAS funded, alongside the HDC trial, a trial using 6 New Jersey (USA) cultivars.

Assessment of plant survival rate, crop vigour, diseases and foliage greenness were recorded during the entire period, and of harvest data during the period 1997-2000. A number of cultivars performed well during the six year period.

It was recommended by the HDC that no further records should be taken after 2000 until a gap of three years had elapsed. At that time it was agreed that a reduced number of cultivars be recorded for harvest data in 2003, to assess the longevity of some of the better performing cultivars.

In order to identify the number of cultivars for this exercise, HDC agreed to fund ADAS to record fern numbers and crop vigour on the cultivars previously funded by the HDC and the six New Jersey cultivars. These assessments were recorded on 14 October 2002.

Summary of Results and Conclusions

The Dutch cultivars generally provided the best performance in terms of fern numbers and crop vigour.

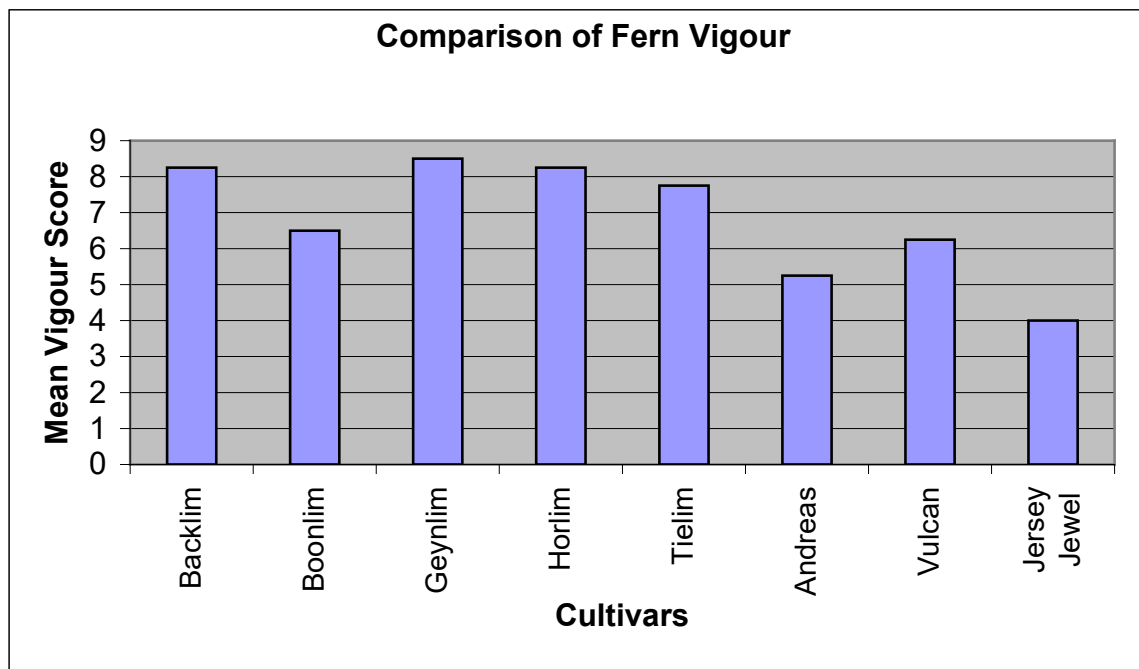
The following eight cultivars are recommended for detailed harvest assessments in 2003 :-

Geynlim, Backlim, Horlim, Tielim, Boonlim, Vulcan, Andreas and Jersey Jewel

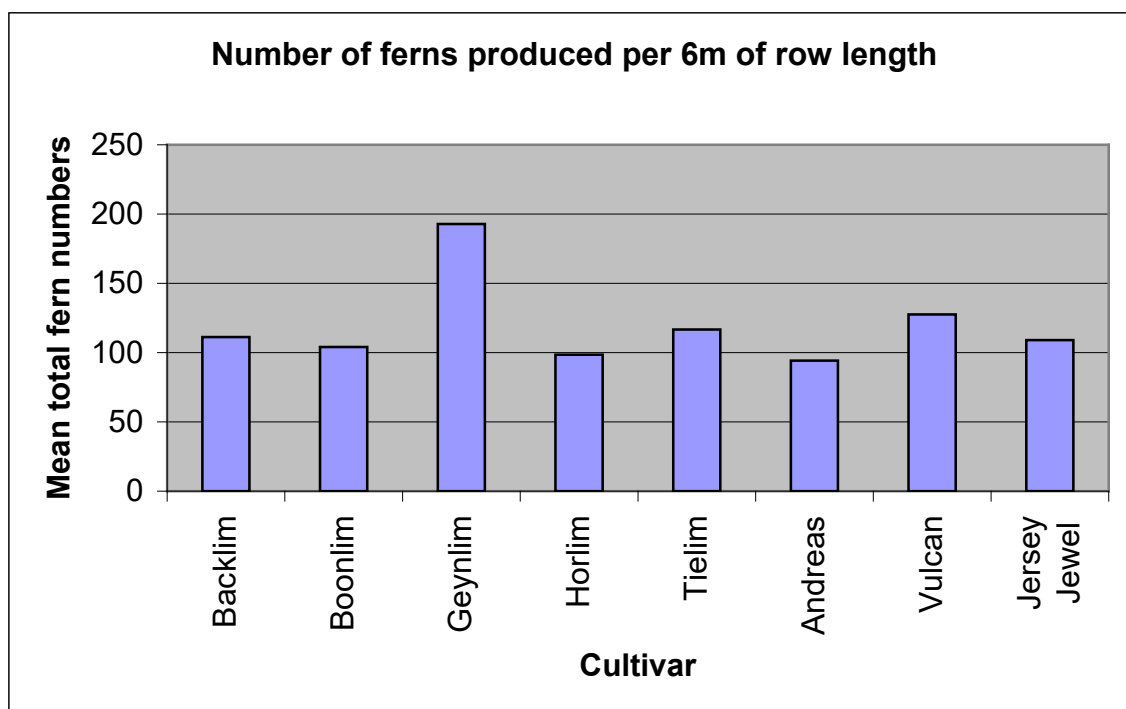
Other Dutch cultivars such as Carlim, Venlim and Franklim could have been recommended because of their good performance but are not included due to their unavailability.

French cultivars are grown in the UK. Andreas is the best performing of the French cultivars and it is recommended that it be included.

Similarly, the New Jersey cultivars are being planted in the UK. Although their trials performance is poor, Jersey Jewel is the best performing cultivar in the group and for this reason it is recommended for inclusion for harvest data recording in 2003.



Graph 1. Comparison of fern vigour (0-9, where 9 represents the most vigorous), based on the amount of fern growth



Graph 2 Comparison of the number of ferns produced per 6m of row length

Action Points for Growers

The cultivars detailed above short list a number of cultivars for harvest assessments in 2003. The five Dutch cultivars are likely to form the basis of cultivar selection for the bulk of the sites in the UK in the foreseeable future as they have produced the best fern and crop vigour performance, and in previous years good yields.

Further harvest data will provide valuable information on the longevity (at 8 years after planting) of the eight cultivars that are recommended for this assessment. The other eighteen cultivars assessed have performed poorly in the trial, and based on the assessments made, are not recommended for any further recording.

Anticipated Practical and Financial Benefits

Harvest data collected in 2003 from a group of eight cultivars will produce data on cultivars in their eighth year from planting. At this point growers will be in a good position to select a cultivar that is likely to perform well under UK conditions.

SCIENCE SECTION

Introduction

Asparagus crops are expensive to establish. Cultivar selection is the most important decision growers make in establishing an asparagus crop. A trial of 20 cultivars funded by the HDC was established in 1995 and comparisons were made during the period 1995-2000. During the same period, ADAS funded alongside it a cultivar trial using 6 New Jersey cultivars.

Assessments of plant survival rate, crop vigour, diseases and foliage greenness were recorded during the entire period, and of harvest data during the period 1997-2000. A number of cultivars performed well throughout the six year period.

It was recommended by the HDC that no further records should be taken after 2000, until a gap of three years had elapsed. At that time it was agreed that a reduced number of cultivars be recorded for harvest data in 2003 to assess the longevity of some of the better performing cultivars.

In order to identify the choice of cultivars for this exercise, HDC agreed to fund ADAS to record fern numbers and crop vigour on the cultivars previously funded by the HDC and the six New Jersey cultivars.

The results of these assessments form the basis for recommending cultivars for recording harvest data in 2003.

Objective

Asparagus – to compare the performance of 26 asparagus cultivars in the autumn of 2002 for fern numbers and crop vigour.

Materials and methods

Site

The trial is being carried out at Portwood Farm, Great Ellingham, Nr Attleborough, Norfolk. The soil type is a sandy loam with some stones, of approximately 30 cms (12 ins) depth, over a sandy clay loam. The site is well drained.

Treatments

Cultivars and Country of Origin

HDC trial

Backlim, Boonlim, Carlim, Franklim) Geynlim, Horlim, Tielim, Venlim)	Holland
Andreas, Jacq ma 2004, Jaq ma 2014	France
Atlas, Jersey Giant, Purple Passion, UC157	USA
JWC1, Taramea	New Zealand
Aarslev 270	Denmark
Eros	Italy
Vulcan	Germany

ADAS trial

Jersey Gem, Jersey General, Jersey Jewel) Jersey King, Jersey Knight, Jersey Prince)	New Jersey USA
---	-------------------

Husbandry

The trial was planted in mid June 1995 with plants raised under glass in containers. It was established in single rows at 1.50 m (5 feet) centres with an in-row spacing of 30 cms (12 ins) giving a plant population of 21,530 per hectare (8.700 per acre). Irrigation was applied on several occasions to aid establishment. The first harvest was taken in 1997 for a short season and for full seasons in 1998, 1999 and 2000.

The trial was sited in the middle of a commercial block of asparagus established at the same time. Cultural operations such as pest, disease and weed control were carried out to a high commercial standard.

Assessments

Assessments were made for fern numbers and crop vigour (based on height, fern numbers and vigour of growth) on 14 October 2002.

Design and analyses

The trial design consists of randomised blocks with four replications, (three for the New Jersey cultivars).

Plot size – 7.8 m x 3 m (2 single rows) totalling 23.4 m² with the number of plants planted being 52. A guard row was planted on either side of each plot.

Recordable area – for fern numbers – 3m of row in each of the two rows in each replicate. An overall assessment of each plot was also made for crop vigour.

Results were examined by analysis of variance, or Friedman's non-parametric test where the data were not suitable for ANOVA. Where appropriate, means were separated using Duncan's New Multiple Range Test.

RESULTS AND DISCUSSIONS

The mean values of all the variables assessed are shown in Tables 1-4.

Table 1. Comparison of fern vigour (0-9, where 9 represents the most vigorous), based on the amount of fern growth (number and height of stems and density of fern) of 20 asparagus cultivars – October 2002.

Cultivars & Origin	Mean Vigour Score (0 – 9)
<u>Dutch</u>	
Backlim	8.25
Boonlim	6.50
Carlim	6.50
Franklim	5.25
Geynlim	8.50
Horlim	8.25
Tielim	7.75
Venlim	6.25
<u>French</u>	
Andreas	5.25
Jacq ma 2004	2.25
Jacq ma 2014	2.75
<u>USA</u>	
Atlas	1.00
Jersey Giant	2.50
Purple Passion	1.50
UC 157	0.50
<u>New Zealand</u>	
JWC 1	3.00
Taramea	3.50
<u>Others</u>	
Aarslev 270	4.25
Eros	4.50
Vulcan	6.25
Mean	4.73
p	<0.001
d.f	9

Comments

Geynlim, Horlim and Backlim were the three most vigorous cultivars. UC 157, Atlas and Purple Passion were the least vigorous.

Table 2. Comparison of fern vigour (0-9, where 9 represents the most vigorous) based on the amount of fern growth, of six New Jersey cultivars of asparagus – October 2002.

Cultivars	Mean Vigour Score (0 – 9)
Jersey Gem	2.33
Jersey General	2.33
Jersey Jewel	4.00
Jersey King	1.66
Jersey Knight	1.33
Jersey Prince	2.00
Mean	2.28
p	<0.05
d.f	5

Comments

The most vigorous cultivar was Jersey Jewel and the least vigorous were Jersey Knight and Jersey King.

Table 3. Comparison of the number of ferns produced per 6m of row length of 20 asparagus cultivars – October 2002.

Cultivar	Mean Total Fern numbers in 6m row length	
Backlim	111.2	ghij
Boonlim	104.0	ghi
Carlim	134.8	j
Franklim	133.5	ij
Geynlim	192.8	k
Horlim	98.5	fgh
Tielim	116.7	ghij
Venlim	127.5	hij
Andreas	94.2	fg
Jacq ma 2004	35.5	bc
Jacq ma 2014	48.0	cde
Atlas	8.0	a
Jersey Giant	42.8	cd
Purple Passion	12.8	ab
UC157	5.5	a
JWC 1	39.2	bc
Taramea	70.2	def
Aarslev 270	87.7	fg
Eros	72.5	ef
Vulcan	127.5	hij
Mean	83.15	
P	<0.001	
% cv	22	
Resid d.f.	57	
S.e.d.	13.03	

Data analysed by ANOVA. The letters after the figures are generated by a Duncan's test. Cultivars sharing a common letter are not significantly different at the 5% level.

Comments

Geynlim produced significantly more ferns when compared with the other cultivars. UC 157 and Atlas have produced significantly fewer ferns.

Table 4. Comparison of the number of ferns produced per 6m of row length of 6 Jersey asparagus cultivars – October 2002.

Cultivar	Mean total fern numbers in 6 m row length	
Jersey Gem	21.3	a
Jersey General	29.7	a
Jersey Jewel	109.0	b
Jersey King	23.7	a
Jersey Knight	13.3	a
Jersey Prince	40.3	b
Mean	39.6	
P	<0.01	
% cv	45.5	
Resid d.f.	10	
S.e.d.	14.69	

Data analysed by ANOVA. The letters after the figures are generated by a Duncan's test. Cultivars sharing a common letter are not significantly different at the 5% level.

Comments

Jersey Jewel has considerably more ferns compared with the other cultivars in this group. Jersey Prince is significantly different from the remaining cultivars.

CONCLUSIONS AND RECOMMENDATIONS

As a result of assessments made on 26 cultivars for fern numbers and crop vigour, a number of cultivars can be shortlisted for further recording of harvest data in 2003. This will provide information on longevity of the cultivars in what will be their eighth year from establishment.

The Dutch cultivars generally provided the best performance.

Cultivars recommended for harvesting assessments in 2003 are:-

Geynlim, Backlim, Horlim, Tielim, Boonlim, Vulcan, Andreas and Jersey Jewel.

Other Dutch cultivars such as Carlim, Venlim and Franklim could have been recommended because of their good performance, but are not included due to their unavailability.

French cultivars are grown in the UK. Andreas is the best performing of the French cultivars and it is recommended that it be included in the planned evaluation in 2003.

Similarly, the New Jersey cultivars are being planted in the UK. Although their trials performance is poor, Jersey Jewel is the best performing cultivar in the group and for this reason it is recommended for inclusion for harvest data recording in 2003.