

# **ASPARAGUS CULTIVAR EVALUATION AFTER FOUR YEARS OF HARVEST**

A. Evenhuis<sup>1</sup>, F. Kanters<sup>2</sup>, M.E.T. Vlaswinkel<sup>3</sup>, R. van den Broek<sup>4</sup> and J.T. Poll<sup>1</sup>

1) Applied Research for Arable Farming and Field Production of Vegetables, PO BOX 430, 8200 AK Lelystad, The Netherlands, 2) Proeftuin Noord Limburg Horst, 3) ROC Westmaas en 4) Proeftuin Zwaagdijk.

## **Abstract**

Under Dutch conditions the best results in green spear production are obtained with local varieties. Gijnlim produced the highest yield combined with a good quality.

## **Introduction**

Green asparagus has been introduced in the Netherlands in the 1980's. Traditionally white asparagus is grown, but mainly on sandy soils. Whereas green asparagus is grown on clay soils. The choice of a suitable variety is very important because asparagus is grown for ten years or more. In the Netherlands the cultivars available were developed especially for white spear production. Knowledge on the suitability of these cultivars for green spear production was scarce but necessary. Therefore in 1991 field trials were started to compare twelve asparagus cultivars under Dutch circumstances. The aim of this study was to elucidate whether green spear production required different varieties than are used for white spear production. A suitable cultivar should combine a good quality and a high yield.

## **Materials and Methods**

Two field trials were established in Colijnsplaat and Zwaagdijk in 1991. Details on the experiment are given in table 1. The experiments were carried out with 12 cultivars in a randomised block design.

**Table 1. Technical data on the field experiments at Colijnsplaat and Zwaagdijk.**

Treatments	location	
	Colijnsplaat	Zwaagdijk
Soil type	loamy clay	clay
fraction smaller than 0.061 mm	31	22
pH	7.4	6.8
organic matter content %	1.5	6.0
previous crop	smooth stalked meadow grass	courgette
number of replicates	4	3
sowing date	5 April 1991	5 April 1991
planting date	4 June 1991	5 June 1991
plant distance	1.50 * 0.2 m	1.50 * 0.2 m
plot size	1.50 * 8 m	1.50 * 7 m
harvest period 1992	none	4 May - 15 May
harvest period 1993	20 April - 19 May	1 May - 19 May
harvest period 1994	1 May - 24 June	13 May - 19 June
harvest period 1995	4 May - 21 June	28 April - 24 June
harvest period 1996	1 May - 21 June	7 May - 21 June

Asparagus was grown under normal agricultural practise as described by Poll (1992). Asparagus spears were harvested daily. The period of harvesting ranged from the end of April until the 24<sup>th</sup> of June (table 1). Spears were graded into three classes (1, 2, and 3). Class number 1 was subdivided into grades depending upon the diameter of the spear:

**Table 2. Grades of asparagus spears.**

Grade	spear diameter
AA	> 20 mm
A	16-20
B	12-16
C	10-12

The harvested spears were counted and weighed per class. The number of open headed and bend spears was established also. The mean total spear weight and the mean spear weight in class 1 were calculated. The percentage of spears in classes 1, 2 and 3 was calculated based upon weight of the harvested spears. The percentage of open spear heads and bend spears was calculated.

Spear quality was determined two times per season on both locations, except in 1993 when quality of the spears was observed once. The total spear harvest of approximately one week was judged by a committee of people. This committee was formed by people from breeding stations, farmers and researchers. Judgements were made on spear tightness, homogeneity of the spears, the bending of the spears, the surface roughness and the colour. A mark between 1 and 9 was given for each quality characteristic. A higher rating was given when the cultivar was better on the given characteristic.

### **Statistics**

Data on yield, spear weight, percentage of spears in different classes were analysed by analysis of variance (ANOVA). For each year the mean of the quality ratings was calculated. ANOVA was conducted on the means of the quality characteristics over the years and locations.

### **Results**

The yield of the cultivars tested was relatively stable at Colijnsplaat (figure 1) during 1994 until 1996. At Zwaagdijk spear yield increased every year (figure 2).

A tendency was found that in the Northern part of the Netherlands problems with open spears were less severe. In 1996 *Stemphylium* was found on the harvested spears. The fungus was found during a cool period after some rainfall.

## Discussion

Five years after planting the first results are presented. It should be pointed out that the growing of asparagus might extend 5 more years or even longer. No data on productivity under Dutch circumstances are available yet.

The performance of Violetto d'Albenga as a green asparagus crop was poor. However Violetto is interesting because of its purple colour. A speciality market might be available for this variety. Known green asparagus cultivars disappointed in the trials in the Netherlands so far. Cultivars, usually grown for white spear production, yielded better in green spear production than Jersey Giant, Huchels Leistungs Auslese and Spaganiva. The results are in accordance with the results of Uragami and Nagai (1993) who also found that Gijnlim and Vulkan (Lucullus 234) gave better yields than Jersey Giant over a 4 year period. However, Mullen *et al.* (1993) found that Jersey Giant performed better than Gijnlim in field trials in California. These data indicate that the site on which asparagus is to be grown is decisive for the choice of the cultivar. In Germany farmers are advised to use Dutch and German cultivars because they are better suited to the local conditions (Paschold *et al.*, 1993).

From these preliminary results it is concluded that research will be continued on the cultivars Backlim, Calet, Horlim, Gijnlim, Thielim and Venlim. The other cultivars will not be tested in the forthcoming years mainly because of poor quality or low productivity. An economic evaluation will only be useful at the end of the experiments.

## References

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**Table 3. Mean yield, spear weight, percentage of spears per class, grading and quality aspects, observed at Colijnsplaat and Zwaagdijk.**

Cultivar	yield		spear weight (g)		grading based on total weight (%)			grading based on spear weight of class 1 (%)				% open spears	% bending spears
	(t/ha)	relative	total	class 1	class 1	class 2	class 3	AA	A	B	C		
Backlim	6.0	114	30.9	34.5	72	21	7	9	39	42	11	8	10
Boonlim	4.8	85	27.4	30.4	63	28	9	4	31	49	16	14	10
Calet	6.0	111	15.9	21.1	56	13	31	0	2	39	58	5	3
Gijnlim	8.1	144	25.3	28.6	75	15	10	3	22	55	21	3	10
Horlim	5.9	109	25.8	29.1	72	17	10	4	22	53	21	6	9
Huchel	4.9	89	23.2	27.2	69	17	14	2	17	54	26	6	7
Jersey Giant	3.6	61	19.3	23.4	70	12	18	0	6	52	41	2	6
Vulkan	6.9	124	22.0	25.5	62	25	13	1	13	55	30	12	7
Spaganiva	4.8	86	20.5	24.9	69	14	18	1	13	52	34	5	5
Thielim	5.9	106	29.2	31.9	68	23	8	8	32	45	15	9	11
Venlim	6.7	124	29.3	32.9	70	22	8	6	33	49	12	7	11
Violetto	2.7	46	21.7	26.6	75	10	16	3	15	53	29	0	6
mean	5.5	100	24.2	28.0	68	18	14	3	20	50	26	6	8
lsd ( =0.05)	0.8	15	2.0	1.9	3	3	3	3	5	5	6	2	2

**Table 4. Mean rates for homogeneity of the spears, spear tightness, straightness and surface roughness given by the committee at Colijnsplaat and at Zwaagdijk in the years 1993 - 1996.**

Cultivar	homogeneity of the spears	spear tightness	straightness of the spears	surface roughness	<i>Stemphylium</i> <sup>a</sup> i
Backlim	6.5	6.1	6.3	5.9	6.1
Boonlim	6.0	5.6	6.2	5.8	5.7
Calet	7.1	6.4	6.9	6.8	5.2
Gijnlim	6.8	6.7	6.7	6.5	6.8
Horlim	6.3	6.3	6.4	6.2	6.1
Huchel	5.7	5.9	6.3	6.0	5.4
Jersey Giant	6.5	6.8	6.5	6.3	5.0
Vulkan	6.5	5.3	6.5	6.0	5.4
Spaganiva	6.1	5.9	6.6	5.9	6.2
Thielim	6.2	5.9	6.2	5.9	5.7
Venlim	6.3	6.1	6.1	5.9	5.8
Violetto	5.7	7.6	6.4	7.0	7.1
mean	6.3	6.2	6.4	6.2	5.9
lsd ( = 0.05)	0.3	0.3	0.3	0.2	0.8

a: *Stemphylium* was observed in 1996, at the first committee meeting at both locations. b: a higher rating means the variety performs better on the given characteristic

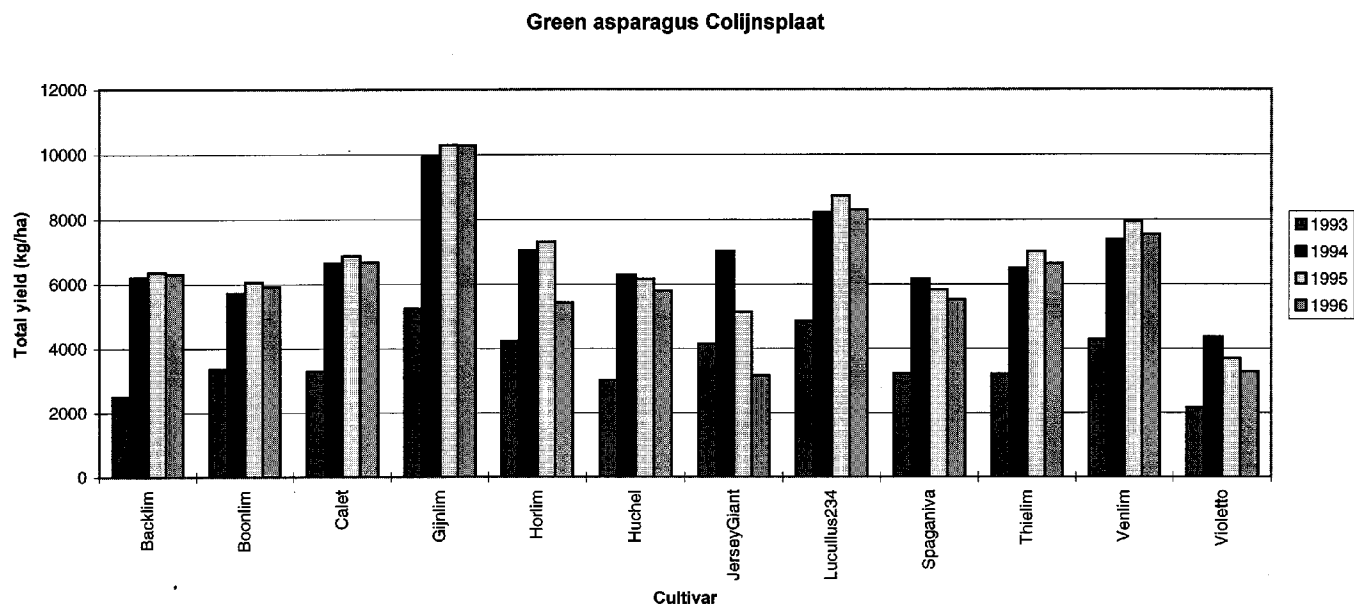


Figure 1. Yield off green aparagus in the years 1993 to 1996 at Colijnsplaat.



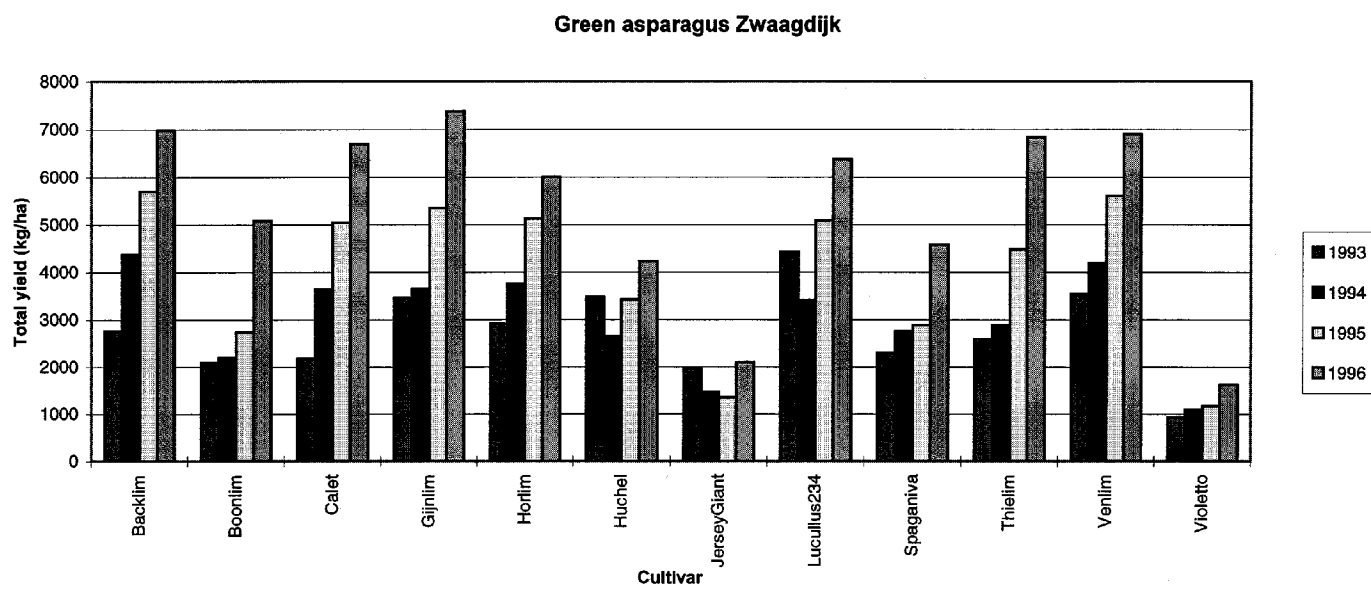


Figure 2. Yield of green asparagus in the years 1993 to 1996 at Zwaagdijk.