

Project Title: Vining Peas: Evaluation of new and established varieties sown at appropriate commercial timings

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Project Leader: Mr. S. J. Belcher

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Key Workers: Mr. S. J. Belcher (project leader)
Dr A. J. Biddle (pathology trials)

Location of Project: Processors and Growers Research Organisation
Great North Road
Thornhaugh
Peterborough
PE8 6HJ

Project co-ordinator: Mr T. Mudge
PVGA
133 Eastgate
Louth
LN11 9QG

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GROWER SUMMARY

Headline

The farmgate value of the vining pea crop in the UK is worth about £37M. Variety choice is important for vining pea production and reliable and accurate information is key to this. PGRO is the only independent source of information for variety data.

Data obtained is added to the 'Advisory Leaflet on Vining Pea Varieties' and builds on data previously obtained. This gives growers a reference to most of the current varieties grown in the UK

This leaflet is available free of charge from PGRO or can be downloaded from the PGRO Website www.pgro.org.

Using this leaflet, growers can make informed decisions on varietal choice, but it should be noted that varietal performance can differ with site and seasons and small areas of a new variety should be evaluated before planning a large programme.

Background

Varietal selection is an important and key element of vining pea production to ensure a sequential programmed harvest period and to maintain high quality produce.

The PGRO evaluates a large number of varieties per annum including approximately 15 at National List Stage in Preliminary Trial and about 5 of the best ones are chosen for further evaluation in the Main Trial. Varieties are replicated three times and each plot has to be harvested at different stages of maturity to enable yield and size grade data to be presented for the practical freezing stage (TR 100) and practical canning stage (TR 120). This dictates that the trials are only sown on one date (usually early to mid-March for the Main Trial and mid-April for the Preliminary Trial), despite the fact that both trials contain early, mid-season and late varieties which commercially would be sown from late February to mid-May respectively.

Several promising varieties have been tested in recent years and more information on their performance and relative maturity within a maturity group is needed at the likely commercial sowing time. Early varieties would therefore be tested under cool establishment conditions with a long period from sowing to harvest while, in contrast, late maincrop varieties would be tested under conditions of rapid establishment and growth. Further work is needed to gain experience in contrasting seasonal weather conditions.

Summary of results

Two early (Twinkle and Dakota), 6 early maincrop (Cabaret, Starlight, Gallant, Zelda, Urbana and Serge), 6 petits pois (Nalesa, Arnesa, Baghera, Corus, Caribou and PL 65) and 5 maincrop (Ranger, Kiros, Ibis, Akura and Geisha) varieties of vining peas were compared to Bikini for yield and maturity. Avola was included as a maturity check in the Early Trial, Waverex in the Petits Pois Trial and Ambassador in the Maincrop Trial.

Early and Second Early Varieties - 2006

Dakota matured very early this year, one day before Avola. Yields were significantly lower than Bikini, but a little higher than Avola at TR100. Haulm was medium-long similar in length to Bikini. Produce was smaller than Avola and had a good, even colour. Maturing at the same time as Avola, Twinkle had shorter haulm than Avola and gave slightly higher yields at TR100. Produce was a little smaller than Avola, uneven in colour and with blond peas in the frozen sample.

Early Maincrop Varieties - 2006

Website (in 2005) and Zodiac (in 2006) were withdrawn from trials by the breeders. Bikini gave only a small yield increase from TR100 to TR120. There were few statistically significant yield differences between the varieties in trial and the standard, but there were some significant differences between pairs of varieties.

Cabaret matured one day before Bikini. Yields were better than in 2005, higher than Bikini, but not significantly so. Produce was smaller than Bikini, medium-small size grade. Peas had an even, but dull colour.

Bikini had short haulm. Produce was medium size grade and a little uneven in colour.

Zelda and Starlight matured 1 day later than Bikini.

Zelda was semi-leafless and had long haulm. Yields were a little lower than Bikini at TR100. Produce was a little smaller than Bikini, medium-small size grade.

Starlight had longer haulm than Bikini and gave yields a little lower than Bikini. Produce was similar size grade to Bikini.

Serge, Urbana and Gallant were semi-leafless and matured 2 days later than Bikini.

Serge had longer haulm than Bikini, Yields were a little higher than Bikini at TR100 and produce was similar size grade.

Urbana had long haulm. Yields were lower than Bikini, but not significantly so. However, produce was smaller than Bikini, medium-small size grade.

Gallant had similar length haulm to Bikini. Yields were low, significantly lower than Bikini at TR100. Produce was a little smaller than Bikini.

Petits Pois Varieties - 2006

The trial was located in a major petits pois production area near Holbeach, South Lincolnshire. Growth in this trial was more vigorous than at the Thornhaugh site. Generally produce colour was not as even as the Thornhaugh site. Bikini gave high yields at this site. Produce was generally a little larger than seen in previous years.

Baghera matured 5 days before Bikini and had very short haulm. Yields were lower than Waverex, significantly so at TR120. Produce had even colour and was a little smaller than Waverex, with 79% of the peas <8.75mm diameter.

Corus matured at the same time as Bikini and had similar length haulm to Waverex. Yields were low, significantly lower than Waverex at TR120. Produce was a little larger than Waverex with 71% of the peas <8.75mm diameter.

Caribou, Nalesa and PL 65 matured 2 days later than Bikini.

Caribou had similar length haulm to Waverex and gave good yields, higher than Waverex. Produce was larger than Waverex, however, small-medium size grade with only 64% of the peas <8.75mm diameter.

Nalesa was semi-leafless, had similar length haulm to Waverex and was nearly erect at harvest. Yields were a little lower than Waverex at TR100. Produce was larger than Waverex, small-medium size grade with only 60% of the peas <8.75mm diameter.

PL 65 had long haulm and rather heavy foliage. Yields were similar to Waverex and the produce was only a little larger with 65% of the peas <8.75mm diameter. Peas had uneven colour and there were blond peas in the frozen sample.

Maturing 4 days later than Bikini, Arnesa was semi-leafless, had short haulm and was nearly erect at harvest. Yields were lower than Waverex, but not significantly so. Produce was very small size grade with 85% of the peas <8.75mm diameter.

Maincrop Varieties - 2006

Bikini yielded well, giving yields a little higher than in the Early Maincrop Trial. All varieties gave statistically lower yields than Bikini.

Bikini was the first to mature, 3 days before Ambassador. Bikini was semi-leafless and semi-fasciated and had short haulm. Produce was medium-large size grade. Peas had an even but dull colour.

Akura, Ibis, Geisha and Ranger matured 2 days later than Bikini.

Akura was semi-leafless and had short haulm. Yields were significantly lower than Bikini, but the produce was much smaller, small-medium size grade. Peas had a bright colour.

Ibis was semi-leafless and had similar length haulm to Bikini. Yields were similar to Ambassador and produce was smaller, medium-small size grade. Peas had a bright colour.

Geisha was semi-leafless with similar length haulm to Bikini. Yields of medium-small size grade peas were a little lower than Ambassador. Peas had a good, bright colour.

Ranger had very short haulm. Yields were similar to Ambassador and produce was similar size, medium-large size grade. Peas had a good, bright colour.

Kiros matured at the same time as Ambassador, 3 days later than Bikini.

Kiros had similar length haulm to Bikini. Yields were similar to Ambassador at TR100, but produce was smaller, medium-small size grade. Peas had a bright, but uneven colour.

Ambassdor had longer haulm than Bikini. Yields as in other trials were significantly lower than Bikini this year. Produce was similar size to Bikini, medium-large size grade. Peas had a very dark, bright colour.

Varietal susceptibility of vining peas to downy mildew (*Peronospora viciae*) - 2006

Varieties of vining peas were sown in disease observation trials at three sites (seed of Dakota and Gallant came pre-treated with Wakil XL and so were not included in the 2005 trials). Each trial was situated in a field with a history of pea growing.

Plants were scored for infection on two or three occasions during the season, to include both primary systemically infected seedlings and secondary infection on the foliage and pods. The data were combined to give an indication of the relative susceptibility to downy mildew on a 1-9 scale of increasing field resistance.

Seed of Gallant, Zelda, Urbana, Kiros, Ibis and Akura came pre treated and were not included in the 2006 trial.

1	3	7	8	9
Very Susceptible	Susceptible	Slightly Susceptible	Moderate Field Resistance	Good Field Resistance
Cabaret	Baghera	Nalesa	Arnesa	Corus
Caribou	Geisha		PL 65	Dakota
Ranger	Serge			
Starlight				
Twinkle				

Varieties varied in their susceptibility to downy mildew. The good field resistance of Nalesa, Arnesa, PL65, Corus and Dakota was confirmed, while Cabaret, Twinkle, Starlight and Caribou appeared a little more susceptible than in previous years.

Varietal susceptibility of vining peas to powdery mildew (*Erysiphe pisi*) - 2006

Susceptibility of many of the varieties was determined in 2004 and 2005. Peas were sown in a disease observation trial at one site at Thornhaugh.

Plants were scored for natural infection at the full pod growth stage. The scores reflected resistance and susceptibility and are shown below:-

Resistant	PL 65
Susceptible	

The results of these tests and those of previous years will be incorporated in the PGRO Advisory Leaflet of Vining Pea Varieties.

Potential benefits

New vining pea varieties in trial represent improvements in yield, size-grade and uniformity compared with older varieties which have been grown for very many years.

Reliable and accurate information on maturity to enable a sequential and uninterrupted harvest schedule to be followed is of great value to growers.

Improvements in colour avoid deductions in payment which can be up to 5%. Growers, processors, retailers and consumers are likely to benefit from these improvements.

Varieties with good field resistance to downy mildew may not need an expensive seed treatment to control the disease.

The data will provide additional information for the growers leaflet 'Vining pea varieties: a descriptive list'. This, together with yearly trials results can be obtained by contacting PGRO or downloaded from the PGRO website www.pgro.org. This leaflet is the only independent source of information for variety data.

SCIENCE SECTION

Introduction

The farmgate value of the vining pea crop in the UK is worth about £37M. Varietal selection is an important and key element of crop production to ensure a programmed harvest period and to maintain high quality produce. To this end PGRO evaluate a large number of varieties per annum including 15 at National List Stage in Preliminary Trial and about 5 of the best ones are chosen for Main Trial. The variety treatment is replicated three times and each plot has to be harvested at different stages of maturity to enable yield and size grade data to be presented for the freezing stage Tenderometer Reading (TR) 100 and TR 120. This dictates that the trials are only sown on one date (usually mid-March for the Main Trial and mid-April for the Preliminary Trial), despite the fact that both trials contain early, mid-season and late varieties which commercially would be sown from late February to mid-May respectively.

Several promising new vining pea varieties with improved yield and with more uniform size-grade and colour have been evaluated in PGRO Main and Preliminary Trials since the 1999 - 2000 project FV 154a. Both Main and Preliminary trials are sown on one date despite the fact that both trials contain early, mid-season and late varieties which commercially would be sown from late February to mid-May respectively. A further factor of vining pea variety evaluation is that because of the specialised equipment needed during harvesting and processing, the independent systematic evaluation of varieties is restricted to the PGRO, Thornhaugh site and one site for petits pois varieties in a commercial crop. This forms the basis for the selection and development of varieties for the 35,000 ha of commercial crops. In practice, commercial programmes are based on the use of a minimum of 4 varieties and it is more likely that 6 or 7 will be used to give a spread of maturity and to allow production for special markets. On the latter point, these can either be premium 'petits pois' or '150 minute' peas or, economy/value packs.

Varietal characteristics affect:

- yield
- quality (colour, flavour, size and texture)
- ease of harvesting
- disease vulnerability
- timeliness
- ease of integration in the harvest programme

and new ones are being actively sought by growers so that they can meet processors specifications for quality with the most productive, reliable and cost effective varieties.

Several promising varieties have been tested in recent years and more information on their performance and relative maturity of varieties within a maturity group is needed at the likely commercial sowing time. Early varieties would therefore be tested under cool establishment conditions with a long period from sowing to harvest while, in contrast, maincrop varieties would be tested under conditions of rapid establishment and growth. Work is needed over three years to gain experience in contrasting weather conditions.

Methods

Vining peas grown according to commercial practice.

Yield standard Bikini

Standards for each group underlined.

Sown:	16 March	10 April	21 April	25 April
Group/trial:	early/second early	early maincrop	petits pois	maincrop
	<u>Avola</u>	<u>Bikini</u>	<u>Waverex</u>	<u>Ambassador</u>
	<u>Bikini</u>	Cabaret	<u>Bikini</u>	<u>Bikini</u>
	Twinkle	Starlight	Nalesa	Ranger
	Dakota	Gallant	Arnesa	Kiros
		Zelda	Baghera	Ibis
		Urbana	Corus	Akura
		Serge	Caribou	Geisha
			PL 65	

Sites: sandy loam soil at Thornhaugh, Cambs in a vining pea growing area; petits pois on a light silt soil in a commercial crop of petits pois in South Lincolnshire

Trial layout: Randomised complete block, 3 replications for trials at Thornhaugh. Randomised block, 2 replications (petits pois).

Plot size: 1.83 m x 19 m

Sub-plots: 1.83 m x 5 m for each of three harvest taken at @TR value 100 (range 95-105), @TR 120 Range 115-130) and a third harvest if required.

Sampling areas for TR assessment: 1.83 m x 2 m

Fungicide seed treatment: Wakil XL

Sown with an Øyjord plot drill to achieve a population of 90 plants m⁻²

Broad-leaved weeds were controlled pre-emergence and post-emergence if necessary.

Aphids were controlled if thresholds reached. Pea moth (*Cydia nigricana*) was controlled if necessary (monitored by pea moth traps).

Fungicide sprays were applied to control *Botrytis* and *Mycosphaerella* depending on weather conditions.

No irrigation was applied.

Haulm lengths measured and standing ability assessed just before harvest.

Maturity assessed from the sampling areas to achieve correct harvest dates for quick-freezing for vined peas using a Martin Pea Tenderometer.

Sub-plots were harvested when appropriate by hand, vined in a plot pea viner and washed. Peas were size-graded with a Mather & Platt size-grader, and weighed and total yield measured.

Samples were quick-frozen for quality appraisal and inspection by processors and growers.

Statistical analysis of yield for each maturity group in each year using ANOVA.

Combined analysis for three years data at the end of year 3.

Disease observation trials

i). Downy mildew

Varieties that came with untreated seed were planted in a double row plot with two replications at two sites in commercial crops of vining peas with a long history of pea growing where natural infection from soil borne oospores was likely to occur. The choice of site increased the likelihood of infection and could include a wider range of pathotypes. Infection scores were made on two occasions during the season and these scores converted to a scale of relative field resistance.

ii) Powdery mildew

Resistance to powdery mildew is controlled by a single gene and varieties are either fully resistant or fully susceptible to the disease. Varieties were planted at Thornhaugh in early June. Natural infection of powdery mildew occurred after flowering in late sown peas and varieties were scored as susceptible or resistant.

Results

With the exception of May the months January to July received less than average rainfall amounts.

January had temperatures close to average, but there was a cold end to the month with several days when temperatures fell below zero. Rainfall was about a quarter of average. February had below average rainfall and a warm middle 2 weeks, but there several days when temperatures fell below zero. March was a cold month with temperatures below average throughout the month. A low of -6°C was recoded on 3 March. Rainfall was $\frac{2}{3}$ of average. Temperatures in April were above average and rainfall was below average. May was a very wet month receiving double the amount of average rainfall. Temperatures were above average. June, however, was again very dry, but very warm with temperatures well above average. July was an exceptionally warm month, with record temperatures being set in parts of the country. Rainfall was a little below average, but fell on few occasions.

Drilling began in early March and the peas emerged well and evenly, with few field losses despite dry conditions at emergence.

Broad-leaved weeds were controlled pre-emergence with Batallion (terbutryn/terbuthylazine) and post-emergence in the Early Maincrop Trial with an application of Pulsar+Fortrol (bentazone/MCPB + cyanazine).

Weevil (*Sitona lineatus*) and field thrips (*Thrips angusticeps*) were controlled with an application of Hallmark (lambda-cyhalothrin). Aphid (*Acyrtosiphon pisum*) was controlled with Aphox (*pirimicarb*).

The harvest started early on 23 June and was completed on 21 July. The peas matured rapidly throughout the season.

Pea colour for most varieties was excellent this year and unless otherwise stated the uniformity of colour was also good. More vigorous growth at the petits pois site gave rise to some unevenness in pea colour for some varieties.

Early and Second Early Varieties – 2006 - Tables 1 & 2

Dakota matured very early this year, one day before Avola. Yields were significantly lower than Bikini, but a little higher than Avola at TR100. Haulm was medium-long similar in length to Bikini. Produce was smaller than Avola and had a good, even colour. Maturing at the same time as Avola, Twinkle had shorter haulm than Avola and gave slightly higher yields at TR100. Produce was a little smaller than Avola, uneven in colour and with blond peas in the frozen sample.

The varieties were evaluated in three very different seasons. Relative maturity was fairly stable over this year period, with Bikini ranging from Avola +7 in 2004 and 2005 to Avola +6 in 2006. Yields from the standard, Bikini were the highest in 2006.

Early and Second Early Varieties – 2004-2006 – Table 3

Avola gave yields a little lower Bikini. Peas generally had lower levels of sweetness in 2006 than 2004 or 2005.

Twinkle (Sharpes) matured at the same time as Avola and had shorter, more determinate haulm than Avola. Yields were similar to Avola and produce was a little smaller than Avola, medium-large size grade. Twinkle had similar sweetness and mealiness scores to Avola.

Dakota (Syngenta Seeds) matured one day later than Avola. Haulm was a little shorter than Avola. It is not a very robust or vigorous variety and probably needs good soil to get the best out of the variety. Yields were lower than Avola, significantly so at TR120. Produce was a little smaller than Avola, with a high percentage of peas in the medium size grade. Dakota had similar sweetness and mealiness scores to Avola.

Early Maincrop Varieties – 2006 - Tables 4 & 5

Website (in 2005) and Zodiac (in 2006) were withdrawn from trials by the breeders. Bikini gave only a small yield increase from TR100 to TR120. There were few statistically significant yield differences between the varieties in trial and the standard, but there were some significant differences between pairs of varieties.

Cabaret matured one day before Bikini. Yields were better than in 2005, higher than Bikini, but not significantly so. Produce was smaller than Bikini, medium-small size grade. Peas had an even, but dull colour.

Bikini had short haulm. Produce was medium size grade and a little uneven in colour.

Zelda and Starlight matured 1 day later than Bikini.

Zelda was semi-leafless and had long haulm. Yields were a little lower than Bikini at TR100. Produce was a little smaller than Bikini, medium-small size grade.

Starlight had longer haulm than Bikini and gave yields a little lower than Bikini. Produce was similar size grade to Bikini.

Serge, Urbana and Gallant were semi-leafless and matured 2 days later than Bikini.

Serge had longer haulm than Bikini, Yields were a little higher than Bikini at TR100 and produce was similar size grade.

Urbana had long haulm. Yields were lower than Bikini, but not significantly so. However, produce was smaller than Bikini, medium-small size grade.

Gallant had similar length haulm to Bikini. Yields were low, significantly lower than Bikini at TR100. Produce was a little smaller than Bikini.

Early Maincrop Varieties – 2004-2006 – Table 6

The varieties were evaluated in three very different seasons. Relative maturity was a little variable over this year period, with 2004 giving different results to 2005 and 2006. Bikini gave very high yields in 2004 and the lowest yields in 2006. There were no statistically significant yield differences between Bikini and other varieties, but there were significant difference between some pairs of varieties

Cabaret (Sharpes) matured one day before Bikini and had haulm a little longer than Bikini. After a poor yield performance in 2005, yields were good in 2006 and overall yields were a little higher than Bikini. Produce was a little smaller than Bikini, medium size grade. Cabaret had higher levels of sweetness than most varieties in trial.

Zelda (Danisco) was semi-leafless, had longer haulm than Bikini and matured one day later than Bikini. Overall yields were a little higher than Bikini, but yields were low in 2006. Produce was similar size grade to Bikini, medium-large size grade. Zelda had lower levels of sweetness compared to Bikini.

Starlight (Sharpes) matured 2 days later than Bikini and had haulm a little longer than Bikini. Starlight gave good yields in 2004, but lower yields in 2005 and 2006. Overall yields were similar to Bikini. Produce was similar size grade to Bikini, medium-large size grade. Starlight had slightly lower sweetness scores than Bikini.

Serge, Urbana and Gallant were all semi-leafless and matured 3 days later than Bikini.

Serge (Pure Line Seeds) had haulm a little longer than Bikini. Overall yields were the highest in this trial series, higher than Bikini, but not significantly so. Produce was medium-large size grade, a little larger than Bikini. Serge had lower levels of sweetness compared to Bikini.

Urbana (Nunhems) had long haulm. Overall yields were similar to Bikini. Produce was the smallest of this group of varieties, smaller than Bikini, medium-small size grade. Urbana had lower levels of sweetness than Bikini, but also lower levels of mealiness.

Gallant (Syngenta Seeds) had similar length haulm to Bikini. Yields were lower than Bikini, but not significantly so. Produce was medium-large size grade and there was little increase in size grade from TR100 to TR120.

Petits Pois Varieties – 2006 – Tables 7 & 8

The trial was located in a major petits pois production area near Holbeach, South Lincolnshire. Growth in this trial was more vigorous than at the Thornhaugh site. Generally produce colour was not as even as the Thornhaugh site. Bikini gave high yields at this site. Produce was generally a little larger than seen in previous years.

Baghera matured 5 days before Bikini and had very short haulm. Yields were lower than Waverex, significantly so at TR120. Produce had even colour and was a little smaller than Waverex, with 79% of the peas <8.75mm diameter.

Corus matured at the same time as Bikini and had similar length haulm to Waverex. Yields were low, significantly lower than Waverex at TR120. Produce was a little larger than Waverex with 71% of the peas <8.75mm diameter.

Caribou, Nalesa and PL 65 matured 2 days later than Bikini.

Caribou had similar length haulm to Waverex and gave good yields, higher than Waverex. Produce was larger than Waverex, however, small-medium size grade with only 64% of the peas <8.75mm diameter.

Nalesa was semi-leafless, had similar length haulm to Waverex and was nearly erect at harvest. Yields were a little lower than Waverex at TR100. Produce was larger than Waverex, small-medium size grade with only 60% of the peas <8.75mm diameter.

PL 65 had long haulm and rather heavy foliage. Yields were similar to Waverex and the produce was only a little larger with 65% of the peas <8.75mm diameter. Peas had uneven colour and there were blond peas in the frozen sample.

Maturing 4 days later than Bikini, Arnesa was semi-leafless, had short haulm and was nearly erect at harvest. Yields were lower than Waverex, but not significantly so. Produce was very small size grade with 85% of the peas <8.75mm diameter.

Petits Pois Varieties – 2004-2006 – Table 9

The trial was located in a major petits pois production area near Holbeach, South Lincolnshire. Nalesa and Arnesa were evaluated in all 3 years while Baghera, Corus, Caribou and PL 65 were evaluated in 2005 and 2006 only. The varieties were evaluated in three very different seasons. Relative maturity was stable over this 3-year period however, with Waverex consistently maturing one day later than Bikini. Yields from the standard, Bikini were very high in 2004, a little lower in 2006 and lowest in 2005. Growth in this trial was more vigorous than at the Thornhaugh site. Generally produce colour was not as even as the Thornhaugh site. Produce was generally a little larger in 2006 than seen in previous years.

Bikini (Syngenta Seeds) gave good yields of medium-large size grade peas.

The petits pois standard **Waverex** (van Waveren) had haulm similar in length to Bikini. Yields were lower than Bikini, significantly so at TR100. Produce was a little larger than normal with 76% of the peas <8.75mm diameter. Peas had slightly higher levels of sweetness than Bikini.

Baghera (Nickerson Zwaan) had slightly longer haulm than Waverex and matured early, 4 to 5 days earlier than Bikini. Yields were similar to Waverex at TR 100, but a little lower at TR120. Produce was a little smaller than Waverex with 82% of the peas <8.75mm diameter. Baghera gave similar levels of sweetness and mealiness to Waverex.

Corus (Syngenta Seeds) matured at the same time as Waverex and had similar length haulm. Yields were consistently low and overall were significantly lower than Waverex at TR120. Produce was a little smaller

than Waverex with 81% of the peas <8.75mm diameter. Corus had lower levels of sweetness than Waverex.

Caribou (Nickerson Zwaan) had slightly longer haulm than Waverex and matured 2 days later than Bikini. Yields were very low in 2004, but high in 2005. Overall yields were higher than Waverex and only a little lower than Bikini at TR120. Produce was larger than Waverex with 68% of the peas <8.75mm diameter and with less peas in the very small size grade than Waverex. Levels of sweetness were higher than Waverex, but so were levels of mealiness.

PL 65 and Nalesa matured 3 days later than Bikini.

PL 65 (Pure Line Seeds) had long haulm and heavier weight foliage than most varieties. Yields were good in 2005 and overall yields were a little higher than Waverex. Produce was similar size to Waverex, with 78% of the peas <8.75mm diameter. Peas had similar levels of sweetness to Waverex, but slightly higher levels of mealiness.

Nalesa (Nunhems) was semi-leafless and had long haulm, but stood well. Yields were high in 2005 and overall were a little higher than Waverex. Produce was a little larger than Waverex with 68% of the peas <8.75mm diameter and with less peas in the very small size grade. Peas had similar levels of sweetness to Waverex, but slightly higher levels of mealiness.

Arnesa (Nunhems) was semi-leafless, had similar length haulm to Waverex, stood well and matured 5 days later than Bikini. Yields were good in 2005 and overall were similar to Waverex at TR100, but lower at TR120. Produce was smaller than Waverex, small-very small size grade, with 87% of the peas <8.75mm diameter. Peas had similar levels of sweetness to Waverex, but slightly higher levels of mealiness.

Late Maincrop Varieties – 2006 - Tables 10 & 11

Bikini yielded well, giving yields a little higher than in the Early Maincrop Trial. All varieties gave statistically lower yields than Bikini.

Bikini was the first to mature, 3 days before Ambassador. Bikini was semi-leafless and semi-fasciated and had short haulm. Produce was medium-large size grade. Peas had an even but dull colour.

Akura, Ibis, Geisha and Ranger matured 2 days later than Bikini.

Akura was semi-leafless and had short haulm. Yields were significantly lower than Bikini, but the produce was much smaller, small-medium size grade. Peas had a bright colour.

Ibis was semi-leafless and had similar length haulm to Bikini. Yields were similar to Ambassador and produce was smaller, medium-small size grade. Peas had a bright colour.

Geisha was semi-leafless with similar length haulm to Bikini. Yields of medium-small size grade peas were a little lower than Ambassador. Peas had a good, bright colour.

Ranger had very short haulm. Yields were similar to Ambassador and produce was similar size, medium-large size grade. Peas had a good, bright colour.

Kirors matured at the same time as Ambassador, 3 days later than Bikini.

Kiros had similar length haulm to Bikini. Yields were similar to Ambassador at TR100, but produce was smaller, medium-small size grade. Peas had a bright, but uneven colour.

Ambassdor had longer haulm than Bikini. Yields as in other trials were significantly lower than Bikini this year. Produce was similar size to Bikini, medium-large size grade. Peas had a very dark, bright colour.

Late Maincrop Varieties – 2004-2006 – Table 12

The varieties were evaluated in three very different seasons. Relative maturity was a little variable over this 3-year period, with 2004 giving different results to 2005 and 2006. Bikini gave lower yields than the Early or Early Maincrop trials, with highest yields being in 2006. Many varieties gave low yields when compared to

Bikini in 2006. There were no statistically significant yield differences between Bikini and other varieties, but there were significant difference between some pairs of varieties

Ibis and Akura were both semi-leafless and matured 2 days later than Bikini.

Ibis (Danisco) had haulm a little longer than Bikini. Yields were very high in 2004 and 2005. Overall yields were very good, the highest of the late maturing varieties, but not significantly higher than Bikini. Produce was slightly smaller than Bikini, medium-small size grade. Ibis had slightly lower levels of sweetness and higher levels of mealiness than Bikini.

Akura (Asgrow) had haulm a little longer than Bikini. Yields were lower than Bikini in all 3 years. Overall, yields of medium-small size grade peas were lower, but not significantly lower than Bikini. Akura gave similar levels of sweetness and mealiness to Bikini.

Geisha (Sharpes) was semi-leafless, had short haulm like Bikini and matured 3 days later than Bikini. Yields were lower, but not significantly lower than Bikini and produce was a little smaller, medium-small size grade. Geisha had lower levels of sweetness and higher levels of mealiness than Bikini.

Kiros and Ranger matured at the same time as Ambassador, 5 days later than Bikini.

Kiros (van Waveren-Brotherton) had short haulm, similar in length to Bikini. Yields were very high in 2004 and 2005, but overall, yields were a little higher than Bikini, but not significantly higher. Produce was a little smaller than Bikini, medium-small size grade. Kiros gave similar levels of sweetness to Bikini.

Ranger (Sharpes) had short haulm, similar in length to Bikini. Yields were very good in 2004 and overall yields were a little higher than Bikini, but not significantly so. Produce was a little larger than Bikini, medium size grade.

Ambassador (van Waveren) had the longest haulm in this group of varieties. Yields were high in 2004, similar to Bikini in 2005 and low in 2006. Overall yields were good, but not significantly higher than Bikini. Produce was a little larger than Bikini, medium size grade. Ambassador gave peas with higher levels of sweetness than Bikini, but also higher levels of mealiness.

Varietal susceptibility of vining peas to downy mildew (*Peronospora viciae*)

Varieties of vining peas were sown in disease observation trials at three sites (seed of Dakota and Gallant came pre-treated with Wakil XL and so were not included in the 2005 trials). Each trial was situated in a field with a history of pea growing.

Plants were scored for infection on two or three occasions during the season, to include both primary systemically infected seedlings and secondary infection on the foliage and pods. The data were combined to give an indication of the relative susceptibility to downy mildew on a 1-9 scale of increasing field resistance.

Seed of Gallant, Zelda, Urbana, Kiros, Ibis and Akura came pre treated and were not included in the 2006 trial

1	3	7	8	9
Very Susceptible	Susceptible	Slightly Susceptible	Moderate Field Resistance	Good Field Resistance
Cabaret	Baghera	Nalesa	Arnesa	Corus
Caribou	Geisha		PL 65	Dakota
Ranger	Serge			
Starlight				
Twinkle				

Varieties varied in their susceptibility to downy mildew. The good field resistance of Nalesa, Arnesa, PL65, Corus and Dakota was confirmed, while Cabaret, Twinkle, Starlight and Caribou appeared a little more susceptible than in previous years.

Varietal susceptibility of vining peas to powdery mildew (*Erysiphe pisi*)

Susceptibility of many of the varieties was determined in 2004 and 2005. Peas were sown in a disease observation trial at one site at Thornhaugh.

Plants were scored for natural infection at the full pod growth stage. The scores reflected resistance and susceptibility and are shown below:-

Resistant	PL 65
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The results of these tests and those of previous years will be incorporated in the PGRO Advisory Leaflet of Vining Pea Varieties.

CONCLUSIONS

New varieties are chosen either by the processor or by growers in consultation with their processor. They can provide additional yield and additional reliability. It is particularly important that maturity data will allow new peas to be correctly integrated into drilling and harvesting programmes.

Information from the trials has been incorporated into the data used to produce the PGRO advisory leaflet on vining pea varieties updated November 2006, a leaflet used extensively by growers, processors and merchants. This leaflet is the only independent source of information for variety data and allows growers to make an informed variety choice.

REFERENCES

- PGRO Variety Trial Results: November 2004
- PGRO Vining Pea Varieties: advisory leaflet November 2004
- PGRO Information Sheet 142: The choice of herbicides for spring peas revised January 2004
- PGRO Variety Trial Results: November 2005
- PGRO Vining Pea Varieties: advisory leaflet November 2005
- PGRO Information Sheet 142: The choice of herbicides for spring peas revised January 2005
- PGRO Variety Trial Results: November 2006
- PGRO Vining Pea Varieties: advisory leaflet November 2006
- PGRO Information Sheet 142: The choice of herbicides for spring peas revised January 2006

TABLES OF RESULTS

TABLE 1 - VINING PEA VARIETY STUDIES. Summary of agronomic data - Vining Pea HDC Early Maturing Trial, Thornhaugh - 2006
 Varieties placed in order of maturity. Standard varieties underlined. All varieties sown on 16 March
 Results are means of three replicates. Target population 90 plants per m² sown in ten 15 cm rows.

Variety	Source	@ TR 100								@ TR 120								Pea wt. as % of total weight	Raw pea colour 1=pale 6=dark
		1000 Seed Weight g	Maturity (± days) Avola	Yield % of Bikini	% in size grades				Maturity (± days) Avola	Yield % of Bikini	% in size grades				Haulm length cm				
					L	M	S	VS			L	M	S	VS					
Dakota	S&G	175	- 1	76 ⁻	35	50	13	2	- 1	70 ⁻	48	44	7	1	66	20	5.5		
Twinkle	Sh	216	0	78 ⁻	39	45	13	3	- 1	76 ⁻	49	40	9	2	57	17	5.0		
<u>Avola</u>	<u>As</u>	<u>202</u>	<u>0(23/6)</u>	<u>64⁻</u>	<u>48</u>	<u>40</u>	<u>10</u>	<u>2</u>	<u>0(26/6)</u>	<u>77⁻</u>	<u>60</u>	<u>33</u>	<u>6</u>	<u>1</u>	<u>68</u>	<u>16</u>	<u>5.0</u>		
<u>Bikini</u>	<u>SLSF</u> <u>S&G</u>	<u>184</u>	<u>+ 6</u>	<u>100</u>	<u>26</u>	<u>56</u>	<u>16</u>	<u>2</u>	<u>+ 6</u>	<u>100</u>	<u>35</u>	<u>55</u>	<u>9</u>	<u>1</u>	<u>46</u>	<u>21</u>	<u>5.5</u>		
				(6.57t/ha)						(6.96t/ha)									
Significance @ P=0.05 v Bikini				SD						SD									
LSD @ P=0.05 (pair)				21.0						19.2									
CV %				14.6						12.8									

KEY: Yield: + Significantly greater than Bikini @ P = 0.05; - Significantly less than Bikini @ P = 0.05
 Size grades: L = large > 10.2mm; M = medium 8.75 - 10.2mm; S = small 7.5 - 8.75mm; VS = very small < 7.5mm
 SL = Semi-leafless; SF = Semi-fasciated
 Source of varieties see Appendix 1

TABLE 2 - VINING PEA VARIETY STUDIES. Summary of quality data - Main Variety Trial and HDC Early Maturing Trial, Thornhaugh - 2006

Variety	Tenderometer Reading	Appearance			Flavour		Texture		
		Colour (3-6)	Brightness (1-2)	Uniformity (1-5)	Sweetness (1-5)	Strength (1-5)	Skin firmness (1-5)	Flesh firmness (1-5)	Flesh mealiness (1-5)
Dakota	99.5	5.17	1.33	4.67	2.00	3.83	3.17	3.17	2.33
Twinkle	101.5	5.50	2.00	3.17	2.17	3.50	3.33	2.33	2.00
Avola	104.0	5.50	2.00	3.33	1.67	3.67	3.00	3.00	2.00
Bikini	97.0	6.00	1.33	4.67	1.67	3.17	2.67	2.17	1.67

KEY: Uniformity; Sweetness; Strength; Skin & Flesh Firmness; Flesh mealiness: (1-5) - a high figure indicates that the variety shows the character to a high degree

Colour: a high figure indicates a darker green; Brightness: 1 = bright, 2 = dull

TABLE 3 - VINING PEA VARIETY STUDIES. Summary of HDC Early Maturing Vining Peas Tested 2004 - 2006
 Varieties placed in order of maturity. Standard varieties underlined.

Variety	Source	@ TR 100								@ TR 120								Pea wt. as % of total weight	Raw pea colour 1=pale 6=dark
		1000 Seed Weight g	Maturity (± days) Avola	Yield % of Bikini	% in size grades				Maturity (± days) Avola	Yield % of Bikini	% in size grades				Haulm length cm				
<u>Avola</u>	<u>As</u>	<u>200</u>	<u>0</u>	<u>95</u>	<u>36</u>	<u>52</u>	<u>11</u>	<u>1</u>	<u>0</u>	<u>96</u>	<u>47</u>	<u>44</u>	<u>8</u>	<u>1</u>	<u>63</u>	<u>19</u>	<u>5.2</u>		
Twinkle	Sh	206	0	97	31	54	13	2	<u>0</u>	96	41	48	10	1	52	20	5.3		
Dakota	S&G	188	+ 1	67	28	53	17	2	+ 1	64 ⁻	38	51	10	1	59	18	5.5		
<u>Bikini</u>	<u>SLSF</u> <u>S&G</u>	<u>180</u>	<u>+7</u>	<u>100</u>	<u>31</u>	<u>56</u>	<u>12</u>	<u>1</u>	<u>+6</u>	<u>100</u>	<u>47</u>	<u>47</u>	<u>5</u>	<u>1</u>	<u>44</u>	<u>18</u>	<u>5.5</u>		
				(6.01t/ha)					(6.71t/ha)										
Significance @ P=0.05 v Bikini				NSD				SD											
LSD @ P=0.05 (pair)				34.8				25.5											
CV %				19.4				14.4											

KEY: Yield: + Significantly greater than Bikini @ P = 0.05; - Significantly less than Bikini @ P = 0.05

Size grades: L = large > 10.2mm; M = medium 8.75 - 10.2mm; S = small 7.5 - 8.75mm; VS = very small < 7.5mm

SL = Semi-leafless; SF = Semi-fasciated

Source of varieties see Appendix 1

TABLE 4 - VINING PEA VARIETY STUDIES. Summary of agronomic data - Vining Pea HDC Early Maincrop Variety Trial, Thornhaugh - 2006
 Varieties placed in order of maturity. Standard varieties underlined. All varieties sown on 10 April
 Results are means of three replicates. Target population 90 plants per m² sown in ten 15 cm rows.

Variety	Source	@ TR 100								@ TR 120								Pea wt. as % of total weight	Raw pea colour 1=pale 6=dark
		1000 Seed Weight g	Maturity (± days) Bikini	Yield % of Bikini	% in size grades				Maturity (± days) Bikini	Yield % of Bikini	% in size grades				Haulm length cm				
					L	M	S	VS			L	M	S	VS					
Cabaret	Sh	223	- 1	113	18	51	27	4	- 1	112	18	59	21	2	53	23	5.5		
<u>Bikini</u>	<u>SLSF</u> <u>S&G</u>	<u>184</u>	<u>0</u> (3/7)	<u>100</u> (4.01t/ha)	<u>24</u>	<u>52</u>	<u>21</u>	<u>3</u>	<u>0</u> (5/7)	<u>100</u> (4.40t/ha)	<u>30</u>	<u>50</u>	<u>17</u>	<u>3</u>	<u>46</u>	<u>19</u>	<u>5.5</u>		
Zelda	SL Dan	194	+ 1	92	16	49	29	6	+ 1	86	16	50	29	5	63	15	5.5		
Starlight	Sh	213	+ 1	91	26	49	20	5	+ 1	83	23	53	21	3	55	20	5.5		
Serge	SL PLS	189	+ 2	106	27	51	19	3	+ 2	96	26	57	15	2	57	18	5.5		
Urbana	SL Nun	155	+ 2	82	7	45	38	10	+ 2	87	9	46	39	6	65	16	5.5		
Gallant	SL S&G	170	+ 2	70	22	48	25	5	+ 2	64	24	49	23	4	50	16	5.5		
Significance @ P=0.05 v Bikini				SD				NSD											
LSD @ P=0.05 (pair)				27.1				36.1											
CV %				16.2				22.4											

KEY: Yield: + Significantly greater than Bikini @ P = 0.05; - Significantly less than Bikini @ P = 0.05
 Size grades: L = large > 10.2mm; M = medium 8.75 - 10.2mm; S = small 7.5 - 8.75mm; VS = very small < 7.5mm
 SL = Semi-leafless; SF = Semi-fasciated
 Source of varieties see Appendix 1

TABLE 5 - VINING PEA VARIETY STUDIES. Summary of quality data – HDC Early Maincrop Variety Trial, Thornhaugh - 2006

Variety	Tenderometer Reading	Appearance			Flavour		Texture		Flesh mealiness
		Colour (3-6)	Brightness (1-2)	Uniformity (1-5)	Sweetness (1-5)	Strength (1-5)	Skin firmness (1-5)	Flesh firmness (1-5)	
Cabaret	105.0	5.33	2.00	4.83	3.17	3.33	3.50	2.83	1.33
Bikini	104.0	5.67	1.67	3.83	2.17	2.67	3.50	2.83	2.00
Zelda	99.0	5.17	1.33	4.17	1.67	3.17	3.67	2.83	2.00
Starlight	107.0	5.83	2.00	4.33	2.00	3.00	4.17	2.83	2.67
Serge	97.5	5.17	2.00	4.83	1.83	3.17	4.33	3.17	2.50
Urbana	103.5	5.50	2.00	4.50	1.33	3.17	3.67	3.00	1.67
Gallant	100.0	5.83	1.33	4.50	2.33	3.17	3.83	3.17	2.50

KEY: Uniformity; Sweetness; Strength; Skin & Flesh Firmness; Flesh mealiness: (1-5) - a high figure indicates that the variety shows the character to a high degree

Colour: a high figure indicates a darker green; Brightness: 1 = bright, 2 = dull

TABLE 6 - VINING PEA VARIETY STUDIES. Summary of HDC Early Maincrop Vining Peas Tested 2004 - 2006
 Varieties placed in order of maturity. Standard varieties underlined.

Variety	Source	1000 Seed Weight g	@ TR 100							@ TR 120							Pea wt. as % of total weight	Raw pea colour 1=pale 6=dark
			Maturity (± days) Bikini	Yield % of Bikini	% in size grades				Maturity (± days) Bikini	Yield % of Bikini	% in size grades				Haulm length cm			
Cabaret	Sh	214	- 1	102	20	53	23	4	- 1	104	26	59	14	1	52	20	5.3	
<u>Bikini</u>	<u>SLSF</u> <u>S&G</u>	<u>180</u>	<u>0</u>	<u>100</u>	<u>29</u>	<u>52</u>	<u>16</u>	<u>3</u>	<u>0</u>	<u>100</u>	<u>44</u>	<u>43</u>	<u>11</u>	<u>2</u>	<u>45</u>	<u>20</u>	<u>5.5</u>	
				(4.971t/ha)						(5.45t/ha)								
Zelda	SL Dan	189	+ 1	107	33	46	17	4	+ 1	103	40	42	15	3	60	18	5.5	
Starlight	Sh	199	+ 2	101	35	46	15	4	+ 2	97	44	45	10	1	52	20	5.2	
Serge	SL PLS	188	+ 3	115	41	45	12	2	+ 3	108	48	42	9	1	53	21	5.1	
Urbana	SL Nun	154	+ 3	101	12	51	31	6	+ 3	99	17	53	26	4	65	18	5.3	
Gallant	SL S&G	167	+ 3	86	34	44	18	4	+ 3	86	35	48	14	3	49	18	5.4	
Significance @ P=0.05 v Bikini				NSD						NSD								
LSD @ P=0.05 (pair)				20.1						18.0								
CV %				11.1						10.2								

KEY: Yield: + Significantly greater than Bikini @ P = 0.05; - Significantly less than Bikini @ P = 0.05

Size grades: L = large > 10.2mm; M = medium 8.75 - 10.2mm; S = small 7.5 - 8.75mm; VS = very small < 7.5mm

SL = Semi-leafless; SF = Semi-fasciated

Source of varieties see Appendix 1

TABLE 7 - VINING PEA VARIETY STUDIES. Summary of agronomic data - Vining Pea HDC Petits Pois Trial, Holbeach, Lincs - 2006
 Varieties placed in order of maturity. Standard varieties underlined. All varieties sown on 21 April
 Results are means of two replicates. Target population 90 plants per m² sown in ten 15 cm rows

Variety	Source	@ TR 100										@ TR 120					Haulm length cm	Pea wt. as % of total weight	Raw pea colour 1=pale 6=dark
		1000 Seed Weight g	Maturity (± days) Bikini	Yield % of Bikini	% in size grades					Maturity (± days) Bikini	Yield % of Bikini	% in size grades							
					L	M	S2	S1	VS			L	M	S2	S1	VS			
Baghera	NiZw	92	- 5	69 ⁻	2	19	20	34	25	- 5	66 ⁻	4	29	31	31	5	48	23	5.0
Corus	S&G	77	0	60 ⁻	2	27	22	31	18	0	60 ⁻	4	33	25	23	15	54	14	5.0
<u>Bikini</u>	<u>SLSF</u> <u>S&G</u>	<u>164</u>	<u>0</u> <u>(10/7)</u>	<u>100</u> <u>(7.93t/ha)</u>	<u>45</u>	<u>41</u>	<u>6</u>	<u>5</u>	<u>3</u>	<u>0</u> <u>(13/7)</u>	<u>100</u> <u>(8.31t/ha)</u>	<u>58</u>	<u>34</u>	<u>4</u>	<u>3</u>	<u>1</u>	<u>60</u>	<u>22</u>	<u>5.5</u>
<u>Waverex</u>	<u>vW</u>	<u>101</u>	<u>+ 1</u>	<u>78⁻</u>	<u>5</u>	<u>28</u>	<u>20</u>	<u>23</u>	<u>24</u>	<u>+ 1</u>	<u>91</u>	<u>7</u>	<u>35</u>	<u>20</u>	<u>22</u>	<u>16</u>	<u>55</u>	<u>20</u>	<u>5.0</u>
Caribou	NiZw	125	+ 2	86	4	32	25	22	17	+ 2	103	5	37	27	20	11	52	20	5.0
Nalesa	SL Nun	104	+ 2	73 ⁻	6	36	19	20	19	+ 2	75 ⁻	5	35	25	23	12	58	22	5.5
PL 65	PLS	103	+ 2	75 ⁻	5	30	20	24	21	+ 2	92	5	35	25	24	11	74	20	4.5
Arnesa	SL Nun	85	+ 4	66 ⁻	1	14	14	32	39	+ 4	78 ⁻	2	24	22	35	17	50	22	5.0
Significance @ P=0.05 v Bikini				SD							SD								
LSD @ P=0.05 (pair)				17.9							19.8								
CV %				11.7							11.9								

KEY: Yield: + Significantly greater than Bikini @ P = 0.05; - Significantly less than Bikini @ P = 0.05

Size grades: L = large > 10.2mm; M = medium >8.75 -10.2mm; S2 = small2 >8.2 - 8.75mm; S1 = small1 >7.5 - 8.2mm; VS = very small < 7.5mm
 (SL) = Semi-leafless; (SF) = Semi-fasciated

Source of varieties see Appendix 1

TABLE 8 - VINING PEA VARIETY STUDIES. Summary of quality data – HDC Petits Pois Trial, Holbeach Lincs – 2006

Variety	Tenderometer Reading	Appearance			Flavour		Texture		Flesh mealiness
		Colour (3-6)	Brightness (1-2)	Uniformity (1-5)	Sweetness (1-5)	Strength (1-5)	Skin firmness (1-5)	Flesh firmness (1-5)	
Baghera	95.0	5.50	1.67	4.00	2.83	2.83	3.83	2.83	1.33
Corus	101.0	5.17	1.33	5.00	2.33	3.17	3.50	2.83	1.67
Bikini	102.0	5.33	1.33	3.67	2.00	3.00	2.50	2.50	2.00
Waverex	98.0	4.67	1.00	3.50	2.67	2.83	3.00	2.83	1.33
Caribou	98.5	4.50	1.67	3.00	3.00	2.67	3.50	2.67	1.67
Nalesa	100.0	5.67	2.00	3.83	2.67	3.00	3.83	3.17	1.67
PL 65	103.0	5.00	1.67	2.33	2.50	3.33	3.67	2.83	2.33
Arnesa	99.5	6.00	1.00	4.83	2.67	2.33	2.50	2.50	1.33

KEY: Uniformity; Sweetness; Strength; Skin & Flesh Firmness; Flesh mealiness: (1-5) - a high figure indicates that the variety shows the character to a high degree

Colour: a high figure indicates a darker green; Brightness: 1 = bright, 2 = dull

TABLE 9 - VINING PEA VARIETY STUDIES. Summary of HDC Petits Pois Vining Peas Tested 2004 - 2006

Varieties placed in order of maturity. Standard varieties underlined.

Variety	Source	1000 Seed Weight g	Maturity (± days) Bikini	Yield % of Bikini	@ TR 100					@ TR 120					Haulm length cm	Pea wt. as % of total weight	Raw pea colour 1=pale 6=dark		
					% in size grades					% in size grades									
					L	M	S2	S1	VS	Maturity (± days) Bikini	Yield % of Bikini	L	M	S2				S1	VS
Standard Varieties																			
<u>Bikini</u>	<u>SLSF</u> <u>S&G</u>	<u>173</u>	<u>0</u>	<u>100</u> (7.25t/ha)	<u>35</u>	<u>46</u>	<u>9</u>	<u>7</u>	<u>3</u>	<u>0</u>	<u>100</u> (7.89t/ha)	<u>42</u>	<u>44</u>	<u>7</u>	<u>5</u>	<u>2</u>	<u>54</u>	<u>21</u>	<u>5.5</u>
<u>Waverex</u>	<u>vW</u>	<u>114</u>	<u>+1</u>	<u>77</u>	<u>3</u>	<u>21</u>	<u>17</u>	<u>27</u>	<u>32</u>	<u>1</u>	<u>83</u>	<u>4</u>	<u>26</u>	<u>20</u>	<u>28</u>	<u>22</u>	<u>55</u>	<u>17</u>	<u>5.0</u>
HDC Funded Varieties																			
Baghera	NiZw	93	- 4	79	2	16	17	32	33	- 5	73	3	22	27	37	11	59	20	4.6
Corus	S&G	81	+ 1	63	1	18	17	35	29	+ 1	61	2	22	21	33	22	55	15	4.9
Caribou	NiZW	128	+ 2	83	4	28	22	27	19	+ 2	96	3	29	25	27	16	59	18	4.9
PL 65	PLS	108	+ 3	81	2	20	19	31	28	+ 3	87	2	23	22	34	19	72	18	4.4
Nalesa	SL Nun	110	+ 3	82	3	29	22	27	19	+ 3	85	4	31	26	27	12	72	18	5.3
Arnesa	SL Nun	85	+ 5	79	1	12	16	36	35	+ 5	79	1	19	21	38	21	57	19	5.1
Significance @ P=0.05 v Bikini				SD					SD										
LSD @ P=0.05 (pair)				22.7					18.1										
CV %				16.1					12.5										

KEY: Yield: + Significantly greater than Bikini @ P = 0.05; - Significantly less than Bikini @ P = 0.05

Size grades: L = large > 10.2mm; M = medium >8.75 -10.2mm; S2 = small2 >8.2 - 8.75mm; S1 = small1 >7.5 - 8.2mm; VS = very small < 7.5mm

(SL) = Semi-leafless; (SF) = Semi-fasciated

Source of varieties see Appendix 1

TABLE 10 - VINING PEA VARIETY STUDIES. Summary of agronomic data - Vining Pea HDC Late Maincrop Variety Trial, Thornhaugh - 2006
 Varieties placed in order of maturity. Standard varieties underlined. All varieties sown on 25 April
 Results are means of three replicates. Target population 90 plants per m² sown in ten 15 cm rows.

Variety	Source		@ TR 100							@ TR 120							Haulm length cm	Pea wt. as % of total weight	Raw pea colour 1=pale 6=dark
			1000 Seed Weight g	Maturity (± days) Bikini	Yield % of Bikini	% in size grades				Maturity (± days) Bikini	Yield % of Bikini	% in size grades							
						L	M	S	VS			L	M	S	VS				
<u>Bikini</u>	<u>SLSF</u>	<u>S&G</u>	<u>164</u>	<u>0</u> (9/7)	<u>100</u> (4.38t/ha)	<u>25</u>	<u>54</u>	<u>18</u>	<u>3</u>	<u>0</u> (10/7)	<u>100</u> (4.72t/ha)	<u>27</u>	<u>56</u>	<u>15</u>	<u>2</u>	<u>44</u>	<u>22</u>	5.5	
Akura	SL	As	170	+ 2	59 ⁻	7	40	42	11	+ 3	57 ⁻	13	47	34	6	46	14	5.5	
Ibis	SL	Dan	168	+ 2	75 ⁻	15	49	27	9	+ 3	70 ⁻	16	50	27	7	47	17	5.5	
Geisha	SL	Sh	200	+ 2	73 ⁻	12	55	27	6	+ 3	71 ⁻	17	57	22	4	48	20	5.5	
Ranger		Sh	200	+ 2	76 ⁻	27	53	17	3	+ 3	76 ⁻	29	53	15	3	39	18	5.5	
Kiros		vWB	176	+ 3	75 ⁻	10	42	38	10	+ 4	69 ⁻	12	46	38	4	42	18	5.5	
Ambassador		vW	186	+ 3	77 ⁻	22	55	19	4	+ 4	79 ⁻	29	59	11	1	52	17	5.5	
Significance @ P=0.05 v Bikini					SD					NSD									
LSD @ P=0.05 (pair)					14.4					18.1									
CV %					10.6					13.7									

KEY: Yield: + Significantly greater than Bikini @ P = 0.05; - Significantly less than Bikini @ P = 0.05
 Size grades: L = large > 10.2mm; M = medium 8.75 - 10.2mm; S = small 7.5 - 8.75mm; VS = very small < 7.5mm
 SL = Semi-leafless; SF = Semi-fasciated
 Source of varieties see Appendix 1

TABLE 11 - VINING PEA VARIETY STUDIES. Summary of quality data – HDC Late Maincrop Variety Trial, Thornhaugh - 2006

Variety	Tenderometer Reading	Appearance			Flavour		Texture		Flesh mealiness
		Colour (3-6)	Brightness (1-2)	Uniformity (1-5)	Sweetness (1-5)	Strength (1-5)	Skin firmness (1-5)	Flesh firmness (1-5)	
Bikini	105.0	5.83	1.67	4.17	2.50	2.83	3.67	2.50	1.67
Akura	99.0	5.83	1.00	5.00	3.00	3.00	3.33	2.67	1.00
Ibis	108.0	5.17	1.00	4.83	1.83	3.33	4.67	3.17	3.00
Geisha	100.0	5.33	1.00	4.50	2.33	3.00	3.17	2.33	1.67
Ranger	101.5	5.83	1.00	4.50	2.83	3.00	2.50	2.33	1.83
Kiros	100.5	5.50	1.00	3.83	3.00	3.00	2.33	2.00	1.00
Ambassador	98.0	6.00	1.00	5.00	4.17	3.50	2.67	2.00	1.33

KEY: Uniformity; Sweetness; Strength; Skin & Flesh Firmness; Flesh mealiness: (1-5) - a high figure indicates that the variety shows the character to a high degree

Colour: a high figure indicates a darker green; Brightness: 1 = bright, 2 = dull

TABLE 12 - VINING PEA VARIETY STUDIES. Summary of HDC Late Maincrop Vining Peas Tested 2004 - 2006
 Varieties placed in order of maturity. Standard varieties underlined.

Variety	Source	1000 Seed Weight g	Maturity (± days) Bikini	Yield % of Bikini	@ TR 100				@ TR 120				Haulm length cm	Pea wt. as % of total weight	Raw pea colour 1=pale 6=dark		
					L	M	S	VS	Maturity (± days) Bikini	Yield % of Bikini	L	M				S	VS
<u>Bikini</u>	<u>SLSF</u> <u>S&G</u>	<u>173</u>	<u>0</u>	<u>100</u> (3.88t/ha)	<u>20</u>	<u>49</u>	<u>26</u>	<u>5</u>	<u>0</u>	<u>100</u> (4.14t/ha)	<u>26</u>	<u>47</u>	<u>23</u>	<u>4</u>	<u>40</u>	<u>19</u>	5.3
Ibis	SL Dan	168	+ 2	115	16	44	31	9	+ 2	124	17	51	26	6	47	19	5.3
Akura	SL As	168	+ 2	76	11	41	37	11	+ 3	72	14	48	32	6	45	15	5.3
Geisha	SL Sh	198	+ 3	87	15	53	26	6	+ 3	90	18	56	22	4	46	20	5.3
Kiros	vWB	175	+ 5	107	14	49	30	7	+ 4	105	18	55	24	3	41	20	5.3
Ranger	Sh	193	+ 5	101	28	51	18	3	+ 5	108	32	53	13	2	40	19	5.5
Ambassador	vW	184	+ 5	110	22	53	21	4	+ 5	110	27	56	15	2	51	18	5.3
Significance @ P=0.05 v Bikini				NSD				NSD									
LSD @ P=0.05 (pair)				28.3				36.8									
CV %				16.0				20.4									

KEY: Yield: + Significantly greater than Bikini @ P = 0.05; - Significantly less than Bikini @ P = 0.05

Size grades: L = large > 10.2mm; M = medium 8.75 - 10.2mm; S = small 7.5 - 8.75mm; VS = very small < 7.5mm

SL = Semi-leafless; SF = Semi-fasciated

Source of varieties see Appendix 1

APPENDIX 1

KEY TO SOURCE OF VARIETIES

<u>CODE</u>	<u>NAME & ADDRESS</u>	<u>COUNTRY</u>
As	Asgrow Research Center PO Box 1235 Twin Falls Idaho. 83303-1235.	USA
vWB	W. Brotherton Seed Co. Inc. P.O. Box 1136 Moses Lake Washington 98837	USA
CM	Crites-Moscow Growers Inc. Box 8912 Moscow Idaho 83843	USA
Dan	Danisco Seed A/S Højbygårdvej 31 DK-4960 Holeby	Denmark
Nun	Nunhem Zaden BV Postbus 4005 6080 AA Haelen	Holland
PLS	Pure Line Seeds Inc. P.O. Box 8866 Moscow Idaho 83843	USA
S&G	Syngenta Seeds SAS. Route de Pouillé B.P. 39 49135 Les Ponts de Cé Cedex	France
Sh	Sharpes, Advanta Seeds UK Ltd. Boston Road Sleaford Lincolnshire NG34 7HA	UK
vW	WAV Industriesaaten GmbH Bordeler Berg 4 D-37127 Dransfield	Germany

APPENDIX 2

PROCESSING DETAILS FOR FROZEN SAMPLES

All samples were sorted to remove damaged or diseased produce and extraneous matter, washed and then blanched in water of 6° hardness. After cooling in tap water and further sorting the samples were packed for freezing.

The processing details for vining peas are given below:-

Blanch:	1.5 min. @ 93°C
Blast frozen	@ -30°C
Stored	@ -18°C