

Project title: Vining Peas: Extension of variety evaluation trials

Project number: FV 340a

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Report: Final report 2015

Previous report: FV 340 - Final report 2011
FV 340a - Annual report 2012

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Location of project: Commercial crops of vining peas near Holbeach, S. Lincs
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The results and conclusions in this report are based on an investigation conducted over a one-year period. The conditions under which the experiments were carried out and the results have been reported in detail and with 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.

AUTHENTICATION

We declare that this work was done under our supervision according to the procedures described herein and that the report represents a true and accurate record of the results obtained.

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GROWER SUMMARY

Headline

This project will provide vining pea growers with independent, relevant and accurate trials evaluations on vining pea varieties, so that a considered and informed variety choice can be made.

Background

Currently vining varieties are evaluated at just one site at PGRO, Thornhaugh with petits pois varieties being evaluated on a silt soil type in South Lincolnshire (trials funded by seedsmen). The soil type at Thornhaugh is representative of only a proportion of the national pea growing production area and varieties can often perform differently in other soil types and areas. These trials on a fertile silt soil type in S. Lincolnshire will give additional data to enable growers to make an appropriate variety choice.

Summary

For full and comprehensive results please refer to the full trials report.

Table of varieties, leaf type, source and approximate maturity - 2014

Variety Name	Leaf Type	Source	Maturity
CS 430 AF	SL	Crites Seed, USA	0
Aloha	C	van Waveren, Germany	0
Avola	C	Seminis Vegetable Seeds, France	0
Kiss	C	van Waveren, Germany	+ 1
Papillon	C	Limagrain, UK	+ 3
Olinda(FP2332)	C	Syngenta Seeds, France	+ 5
Jubilee	C	Limagrain, UK	+ 6
Gusty	SL	van Waveren, Germany	+ 7
Payton(PLS167)	SL	Pure Line Seeds, USA	+ 9
CS 426 AF	SL	Crites Seed, USA	+10
Bikini	SLSF	Syngenta Seeds, France	+11
08570957	SL	Seminis Vegetable Seeds, France	+11
D85178	C	Syngenta Seeds, France	+12
D85410	C	Syngenta Seeds, France	+13
D165250	SL	Syngenta Seeds, France	+13
Oasis	C	Limagrain, UK	+15
Standana	SL	Nunhems Seeds, Netherlands	+15
Ambassador	C	van Waveren, Germany	+16
Acclaim	C	Plant & Food Research Ltd, New Zealand	+16
Maurice	SL	Seminis Vegetable Seeds, France	+17

C=Conventional-leaved; SL=Semi-leafless; SF=Semi-fasciated

Trial site details

Variety Trial Site: Fertile light silt soil in a commercial crop of Vining Peas, near Holbeach Hurn, South Lincolnshire. OS Ref: TF366319.

Downy Mildew Trials: Grid reference TL361851 Gaunt Fen near Chatteris OS Ref: TL361851 and Bicker OS Ref: TF235380.

Table of % yield, % size grade, haulm length and standing ability - 2014

Variety	@TR100				@TR120		Haulm length cm	Standing Ability 9=erect 1=lodged
	Yield % of Oasis	% in size grades L M S VS				Yield % of Oasis		
CS 430 AF	73	27	52	19	2	96	53	4
Aloha	63	41	42	13	4	74	58	3
<u>Avola</u>	<u>56</u>	<u>57</u>	<u>28</u>	<u>12</u>	<u>3</u>	<u>75</u>	<u>59</u>	<u>4</u>
Kiss	73	35	41	20	4	82	64	4
Papillon	62	42	36	17	5	77	56	4
Olinda(FP2332)	62	29	48	19	4	75	64	4
Jubilee	73	29	46	21	4	74	66	3
Gusty	97	44	46	9	1	95	68	2
Payton(PLS167)	80	19	52	25	4	85	68	3
CS 426 AF	83	25	47	24	4	99	70	4
<u>Bikini</u>	<u>67</u>	<u>48</u>	<u>41</u>	<u>10</u>	<u>1</u>	<u>95</u>	<u>52</u>	<u>2</u>
08570957	78	34	55	10	1	84	60	3
D85178	83	21	57	19	3	88	78	4
D85410	77	25	52	20	3	90	76	4
D165250	79	37	47	14	2	85	62	4
<u>Oasis</u>	<u>100</u>	<u>36</u>	<u>46</u>	<u>16</u>	<u>2</u>	<u>100</u>	<u>76</u>	<u>4</u>
	(15.07t/ha)					(15.44t/ha)		
Standana	87	16	56	26	2	92	76	6
<u>Ambassador</u>	<u>88</u>	<u>39</u>	<u>47</u>	<u>12</u>	<u>2</u>	<u>86</u>	<u>90</u>	<u>4</u>
Acclaim	83	19	48	28	5	86	66	3
Maurice	101	26	49	20	5	99	79	7
CS 430 AF	73	27	52	19	2	96	53	4
Aloha	63	41	42	13	4	74	58	3
<u>Avola</u>	<u>56</u>	<u>57</u>	<u>28</u>	<u>12</u>	<u>3</u>	<u>75</u>	<u>59</u>	<u>4</u>
Kiss	73	35	41	20	4	82	64	4
Papillon	62	42	36	17	5	77	56	4
Olinda(FP2332)	62	29	48	19	4	75	64	4

Full information on all varieties can be found in the Full Trial Report.

None of the varieties were found to be unsuitable for UK production

Maturity was a little extended at this site: Bikini +11, Oasis +15 and Ambassador +17. Other varieties showed a similar pattern, but maturity is always judged against the later standards.

Yields from this site were exceptionally high. Oasis gave very high yields, but Maurice gave similar yields. Gusty, as in 2013 gave yields similar to Oasis. CS 426 AF and D85410 yielded well at TR120.

Growth was vigorous at this site, but semi-leafless varieties Maurice and Standana had the better standing ability.

Conclusions are drawn from a 2 year summary of varieties evaluated in 2013 & 2014.

Vining peas are a unique crop in terms of timely harvesting. Varietal selection is an important and key element of vining pea crop production to ensure a programmed harvest period and to maintain high quality.

Papillon (Limagrain UK) matured 3 days later than Avola. Haulm was a little shorter than Avola and had similar standing ability. Yields were significantly lower than Oasis, but a little higher than Avola at TR100. Produce was large-medium size grade, a little smaller than Avola.

Olinda (FP2332) (Syngenta) matured 4 days later than Avola. Haulm was a little shorter than Avola and had similar standing ability. Yields were lower, but not significantly lower than Oasis. Produce was medium-large size grade, but with a large percentage in the medium size grade. Haul was shorter than Avola and had similar standing ability.

Jubilee (Limagrain UK) matured 5 days later than Avola. Yields were lower, but not significantly lower than Oasis. Produce was medium-large size grade, but with a large percentage in the medium size grade. Haulm was longer than Bikini and standing ability was similar.

Gusty (van Waveren) was semi-leafless and matured 6 days later than Avola. Yields of medium-large size grade peas were lower, but not significantly lower than Oasis. Haulm was longer than Bikini, but standing ability was similar.

D85178 (Syngenta) matured one day later than Bikini. Haulm was long, similar in length to Ambassador and standing ability was similar. Yields of medium size grade peas were lower, but not significantly lower than Oasis.

D165250 (Syngenta) was semi-leafless and matured 2 days later than Bikini. Yields were lower, but not significantly lower than Oasis. Peas were medium-large size grade, similar in size to Oasis. Haulm was shorter than Oasis and standing ability similar.

Acclaim (The New Zealand Institute for Plant and Food Research Ltd) matured at the same time as Ambassador, 13 days later than Avola. Yields were lower, but not significantly lower than Oasis. Produce was medium size grade. Haulm was a little shorter than Oasis.

Financial Benefits

The information and findings of this project provide independent and thorough evaluation of the numerous varieties being developed in the industry at the moment.

Action Points

Growers can maximize financial returns by using this information to select the most appropriate varieties for their circumstances.

SCIENCE SECTION

Introduction

Vining peas are a major vegetable crop grown for processing and for the fresh market and peas for freezing and canning occupy 29-36,000 ha per annum, with a value of £ 50M.

The PGRO Processed Legume Panel have identified Varietal selection as an important and key element of crop production to ensure a programmed harvest period and to maintain high quality produce and require as accurate a guide to the performance of varieties in areas typical of pea production areas as possible.

Varietal selection is an important and key element of vining pea crop production to ensure a programmed harvest period and to maintain high quality produce. To this end PGRO evaluates around 15 varieties annually at National List stage funded by Seedsmen and PGRO Levy and the most promising are evaluated in trials for a further two years in the Main Trial. There are no other independent facilities for vining pea evaluation in the UK.

Currently varieties are evaluated at just one site at Thornhaugh with petits pois varieties being evaluated on a silt soil type in South Lincolnshire. The soil type at Thornhaugh is representative of only a proportion of the national pea growing production area and varieties can often perform differently in other soil types and areas. An extension of the PGRO trials system to include an evaluation of the candidate commercial varieties at both Thornhaugh and in South Lincolnshire sites will refine the evaluation process, with additional information to supplement data from established trials. 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.

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. A further factor of vining pea variety evaluation is the use of 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 36,000 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, so called, economy/value packs.

Varietal characteristics affect:

- yield
- quality (colour, flavour, size and texture)
- ease of harvesting
- disease susceptibility
- 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 on a different soil type is needed. Work is needed over at least three years to gain experience in contrasting seasonal weather conditions.

Materials and Methods

Varieties

Table of varieties, leaf type, source and approximate maturity - 2014

Variety Name	Leaf Type	Source	Maturity
CS 430 AF	SL	Crites Seed, USA	0
Aloha	C	van Waveren, Germany	0
Avola	C	Seminis Vegetable Seeds, France	0
Kiss	C	van Waveren, Germany	+ 1
Papillon	C	Limagrain, UK	+ 3
Olinda(FP2332)	C	Syngenta Seeds, France	+ 5
Jubilee	C	Limagrain, UK	+ 6
Gusty	SL	van Waveren, Germany	+ 7
Payton(PLS167)	SL	Pure Line Seeds, USA	+ 9
CS 426 AF	SL	Crites Seed, USA	+10
Bikini	SLSF	Syngenta Seeds, France	+11
08570957	SL	Seminis Vegetable Seeds, France	+11
D85178	C	Syngenta Seeds, France	+12
D85410	C	Syngenta Seeds, France	+13
D165250	SL	Syngenta Seeds, France	+13
Oasis	C	Limagrain, UK	+15
Standana	SL	Nunhems Seeds, Netherlands	+15
Ambassador	C	van Waveren, Germany	+16
Acclaim	C	Plant & Food Research Ltd, New Zealand	+16
Maurice	SL	Seminis Vegetable Seeds, France	+17

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Trial site details

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Downy Mildew Trials: Grid reference TL361851 Gaunt Fen near Chatteris OS Ref: TL361851 and Bicker OS Ref: TF235380.

Sown: 14 April 2014 in commercial crop of vining peas and grown according best local and commercial practice.

Fungicide seed treatment: Wakil XL

Broad-leaved weeds were controlled pre-emergence and (post-emergence where required).

Aphid and pea moth (*Cydia nigricana*) were controlled (monitored by pea moth traps).

Fungicide sprays were applied to control *Botrytis* and *Mycosphaerella* (where required).

No irrigation was applied.

Haulm lengths and standing ability were measured post flowering.

Maturity was assessed from the sampling areas to achieve correct harvest dates for quick-freezing and TR120 harvest stage for vined peas using a Dodman Digital Pea Tenderometer.

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

Samples were blanched, sorted and quick-frozen at @TR100 for quality appraisal and inspection by processors and growers.

Quality aspects of the defrosted and cooked frozen samples were assessed for colour, evenness of colour, brightness of colour and numbers of blond peas.

Measure of sweetness assessed by Brix measurement.

Trial design

Variety Evaluation

Trial layout: Randomised block, 2 replications.

Plot size: 1.83 m x 19 m

Sub-plots: 1.83 m x 3.5 m for up to three harvests taken at @TR 100 (range 95-105), @TR 120 Range 115-130) and a third harvest if required.

Sampling areas for TR assessment: 1.83 m x 1.0 m

Sown with an Øyjord plot drill to achieve a population of 90 plants/m²

Yields were corrected to TR100 and TR120 and statistically analysed using ANOVA.

For varieties that had completed 2 years 2013 & 2014, yields were corrected to TR100 and TR120 and statistically analysed using ANOVA.

Downy Mildew Trials

Fields differed in their location each year and were chosen where there has been a long history of pea cultivation and the potential for a high population of downy mildew (*Peronospora viciae*) was high. Sowing was carried out at a time which was favourable to natural infection taking place. Two replicates of 200 seeds of each variety without any fungicidal seed treatment, were drilled in a double row 5m long. The varieties were randomised. At two occasions, disease assessments were made, the first at about the 4 node stage when the percentage of primary infected seedlings was estimated and the

second assessment was an estimate of the percentage plants showing downy mildew infection and an estimate of the percentage leaf area infected. The scores of these assessments were amalgamated and an overall infection level calculated. Based on the level of infection, a resistance score was allocated using a 1-9 scale where 1 is very susceptible and 9 indicates good field resistance.

Results

Trial records and data collected

Comments below are a summary taken from the meteorology website for the UK <http://www.metoffice.gov.uk/climate/uk/summaries/2014>

Spring 2014

Mean temperatures over the UK were above the long-term average in each of the spring months; May was the sixth consecutive month with above average temperatures. The overall mean temperature for spring was 9.0 °C, which is 1.3 °C above the average, and a remarkable 3.0 °C warmer than spring 2013. It was provisionally the UK's third warmest spring in a series from 1910 (with only the springs of 2007 and 2011 warmer). Nights were often very mild and the UK had its mildest spring for minimum temperatures in a series from 1910. The number of air frosts was also among the lowest on record.

The UK overall received 105% of average spring rainfall. The rainfall pattern was variable with Hampshire the wettest area and north-east Scotland the driest, relative to average. Rainfall totals in March were rather below normal for most parts of the UK, especially East Anglia. April was also rather dry in many areas, but very wet locally in some southern counties of England. May was wetter than average for many, particularly Lincolnshire and Yorkshire and it was the wettest May in north-east England since 1979. The UK overall recorded 85% of average rainfall in March, 96% in April and 143% in May.

Summer 2014

The UK mean temperature for summer 2014 was 14.8 °C which is 0.5 °C above the 1981-2010 average - although it was not as warm as summer 2013. June and July were both warmer than average, but it was the coolest August since 1993, the first colder than average month for the UK since November 2013.

Rainfall totals for the summer were slightly below average for Wales, north England, and parts of south west Scotland, but above average across much of southern England and particularly parts of north and east Scotland. Overall the UK had 108% of average summer rainfall. June and July were generally dry months for many, although heavy summer downpours resulted in totals well above average for parts of East Anglia in July. However, August was wet for most with some localised parts of England and much of northern Scotland receiving more than twice the average rain for the month. It was the wettest month on record for northern Scotland in a series from 1910.

TABLE 1 - VINING PEA VARIETY STUDIES. Summary of agronomic data Standard Vining Pea Main Variety Trial, Holbeach - 2014
 Varieties placed in order of maturity. Standard varieties underlined. All varieties sown on 14 April.
 Results are means of two replicates. Target population 90 plants per m² sown in ten 15 cm rows.

Variety	Source	1000 Seed Weight g	@ TR 100							@ TR 120							Standing Ability 9=erect 1=lodged	Pea wt. as % of total weight	Raw pea colour 1=pale 6=dark
			Maturity (± days) Avola	Yield % of Oasis	% in size grades				Maturity (± days) Avola	Yield % of Oasis	% in size grades				Haulm length cm				
					L	M	S	VS			L	M	S	VS					
CS 430 AF	SL	CS	205	0	73 ⁻	27	52	19	2	0	96	48	44	7	1	53	4	22	5.4
Aloha		vW	213	0	63 ⁻	41	42	13	4	0	74 ⁻	52	36	10	2	58	3	18	5.6
<u>Avola</u>		<u>SVS</u>	<u>224</u>	<u>0(2/7)</u>	<u>56⁻</u>	<u>57</u>	<u>28</u>	<u>12</u>	<u>3</u>	<u>0(4/7)</u>	<u>75⁻</u>	<u>68</u>	<u>25</u>	<u>6</u>	<u>1</u>	<u>59</u>	<u>4</u>	<u>18</u>	<u>5.5</u>
Kiss		vW	191	+1	73 ⁻	35	41	20	4	+1	82	44	41	13	2	64	4	19	5.4
Papillon		LUK	228	+3	62 ⁻	42	36	17	5	+4	77 ⁻	59	27	11	3	56	4	16	5.5
Olinda(FP2332)		Syn	186	+5	62 ⁻	29	48	19	4	+6	75 ⁻	40	49	10	1	64	4	17	5.6
Jubilee		LUK	208	+6	73 ⁻	29	46	21	4	+7	74 ⁻	47	44	7	2	66	3	18	5.5
Gusty	SL	vW	171	+7	97	44	46	9	1	+7	95	52	41	6	1	68	2	17	5.6
Payton(PLS167)	SL	PLS	132	+9	80 ⁻	19	52	25	4	+9	85	21	57	19	3	68	3	20	5.5
CS 426 AF	SL	CS	195	+10	83	25	47	24	4	+10	99	30	58	11	1	70	4	18	5.4
<u>Bikini</u>	<u>SLSF</u>	<u>Syn</u>	<u>205</u>	<u>+11</u>	<u>67⁻</u>	<u>48</u>	<u>41</u>	<u>10</u>	<u>1</u>	<u>+11</u>	<u>95</u>	<u>52</u>	<u>40</u>	<u>7</u>	<u>1</u>	<u>52</u>	<u>2</u>	<u>21</u>	<u>5.5</u>
08570957	SL	SVS	189	+11	78 ⁻	34	55	10	1	+11	84	39	53	7	1	60	3	26	5.8
D85178		Syn	188	+12	83	21	57	19	3	+12	88	23	60	15	2	78	4	19	5.5
D85410		Syn	155	+13	77 ⁻	25	52	20	3	+13	90	37	55	7	1	76	4	22	5.8
D165250	SL	Syn	198	+13	79 ⁻	37	47	14	2	+13	85	52	41	6	1	62	4	20	5.6
<u>Oasis</u>		<u>LUK</u>	<u>195</u>	<u>+15</u>	<u>100</u>	<u>36</u>	<u>46</u>	<u>16</u>	<u>2</u>	<u>+14</u>	<u>100</u>	<u>46</u>	<u>44</u>	<u>9</u>	<u>1</u>	<u>76</u>	<u>4</u>	<u>20</u>	<u>5.5</u>
					(15.07t/ha)						(15.44t/ha)								
Standana	SL	Nun	169	+15	87	16	56	26	2	+15	92	22	73	5	0	76	6	18	5.0
<u>Ambassador</u>		<u>vW</u>	<u>208</u>	<u>+16</u>	<u>88⁻</u>	<u>39</u>	<u>47</u>	<u>12</u>	<u>2</u>	<u>+16</u>	<u>86</u>	<u>46</u>	<u>45</u>	<u>8</u>	<u>1</u>	<u>90</u>	<u>4</u>	<u>22</u>	<u>5.4</u>
Acclaim		PFR	197	+16	83 ⁻	19	48	28	5	+16	86	24	56	18	2	66	3	20	5.0
Maurice	SL	SVS	128	+17	101	26	49	20	5	+16	99	34	50	13	3	79	7	21	5.5
Significance @ P=0.05					SD						SD								
LSD @ P=0.05					18.7						18.0								
CV %					11.4						10.1								

KEY: Yield: + Significantly greater than Oasis @ P = 0.05; - Significantly less than Oasis @ 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 - Standard Vining Pea Main Variety Trial, Holbeach - 2014

Variety	Tenderometer Reading	Appearance				Brix %
		Colour (3-8)	Brightness (1-2)	Uniformity (1-5)	No. of blonds (1-5)	
Aloha	98.5	5.5	1.0	4.5	1.0	9.1
Avola	98.5	4.7	1.0	3.5	1.7	8.4
CS 430 AF	99.0	5.3	1.0	4.7	1.0	8.5
Kiss	101.0	5.3	1.0	4.7	1.0	8.5
Papillon	100.0	5.3	1.0	4.5	1.0	9.3
Olinda(FP2332)	97.5	5.2	1.0	3.2	2.3	8.5
Jubilee	100.0	5.5	1.0	3.7	1.3	9.1
Gusty	106.5	5.8	1.0	4.7	1.0	10.0
Payton(PLS167)	100.5	5.8	1.0	4.3	1.3	9.2
CS 426 AF	100.0	5.3	1.0	4.3	1.0	9.4
08570957	106.5	5.5	1.0	4.7	1.0	9.3
Bikini	105.0	5.3	1.0	4.2	1.0	8.8
D85178	102.0	5.2	1.0	3.0	1.7	8.7
D165250	98.5	4.8	1.0	3.0	2.7	9.9
D85410	100.0	5.3	1.0	3.3	1.3	8.3
Oasis	96.5	4.8	1.0	3.0	2.0	8.8
Standana	99.0	5.3	1.0	4.2	1.0	9.7
Acclaim	95.5	4.8	1.0	3.7	1.3	10.2
Ambassador	93.0	5.3	1.0	3.7	1.7	8.7
Maurice	97.0	5.2	1.0	4.0	1.0	9.4

KEY: Uniformity; Uniformity; No. of blonds; Flavour; Texture: (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; Brix - measured using Atago pocket refractometer PAL-1 and gives an indication of sugar content

TABLE 3 - VINING PEA VARIETY STUDIES. Summary of Standard Vining Peas - Holbeach Tested 2013 - 2014

Varieties placed in order of maturity. Standard varieties underlined

Variety	Source	1000 Seed Weight g	@ TR 100				@ TR 120				Haulm length cm	Standing Ability 9=erect 1=lodged	Pea wt. as % of total weight	Raw pea colour 1=pale 6=dark				
			Maturity (± days) Avola	Yield % of Oasis	% in size grades L M S VS				Maturity (± days) Avola	Yield % of Oasis					% in size grades L M S VS			
<u>Avola</u>	<u>SVS</u>	<u>224</u>	<u>0</u>	<u>57</u>	<u>49</u>	<u>42</u>	<u>7</u>	<u>2</u>	<u>0</u>	<u>81</u>	<u>72</u>	<u>23</u>	<u>4</u>	<u>1</u>	<u>72</u>	<u>3</u>	<u>21</u>	<u>5.5</u>
Papillon	LUK	212	+3	64	38	37	21	4	+3	81	54	32	11	3	65	3	18	5.5
Olinda(FP2332)	Syn	178	+4	75	28	52	17	3	+4	82	37	52	10	1	66	3	20	5.6
Jubilee	LUK	180	+5	75	28	47	22	3	+5	80	45	47	6	2	69	3	19	5.3
Gusty	SL vW	174	+6	87	44	47	8	1	+6	86	51	41	7	1	69	3	17	5.7
<u>Bikini</u>	<u>SLSF Syn</u>	<u>170</u>	<u>+8</u>	<u>70</u>	<u>44</u>	<u>44</u>	<u>10</u>	<u>2</u>	<u>+8</u>	<u>87</u>	<u>50</u>	<u>42</u>	<u>7</u>	<u>1</u>	<u>50</u>	<u>3</u>	<u>20</u>	<u>5.8</u>
D85178	Syn	185	+9	71	20	61	17	2	+9	77	23	62	13	2	90	4	16	5.4
D165250	SL Syn	204	+10	83	39	47	12	2	+10	88	55	40	4	1	60	4	19	5.5
<u>Oasis</u>	<u>LUK</u>	<u>182</u>	<u>+12</u>	<u>100</u>	<u>35</u>	<u>49</u>	<u>14</u>	<u>2</u>	<u>+11</u>	<u>100</u>	<u>44</u>	<u>47</u>	<u>8</u>	<u>1</u>	<u>77</u>	<u>4</u>	<u>20</u>	<u>5.3</u>
				(12.35t/ha)					(12.56t/ha)									
Acclaim	PFR	197	+13	74	20	46	29	5	+13	83	23	53	21	3	71	3	19	5.1
<u>Ambassador</u>	<u>vW</u>	<u>220</u>	<u>+13</u>	<u>88</u>	<u>37</u>	<u>46</u>	<u>14</u>	<u>3</u>	<u>+13</u>	<u>88</u>	<u>45</u>	<u>46</u>	<u>8</u>	<u>1</u>	<u>90</u>	<u>4</u>	<u>21</u>	<u>5.3</u>
Significance @ P=0.05				SD					NSD									
LSD @ P=0.05				29.3					26.3									
CV %				17.1					13.9									

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

TABLE 4 - VINING PEA VARIETY STUDIES. Summary of quality data – Standard pea varieties - Holbeach 2013 & 2014

Variety	Year	Tenderometer Reading	Appearance				Brix %
			Colour (3-8)	Brightness (1-2)	Uniformity (1-5)	No. of blonds (1-5)	
Avola	13	116.0	5.67	1.00	3.17	2.00	9.30
	14	98.5	4.67	1.00	1.67	3.50	8.35
Papillon	13	103.5	5.33	1.33	3.50	1.67	9.70
	14	100.0	5.33	1.00	1.00	4.50	9.30
Olinda	13	114.5	5.33	1.00	3.00	1.67	8.60
	14	97.5	5.17	1.00	2.33	3.17	8.50
Jubilee	13	101.0	5.17	1.00	4.17	1.33	9.60
	14	100.0	5.50	1.00	1.33	3.67	9.10
Gusty	13	106.0	5.67	1.33	4.50	1.00	9.00
	14	106.5	5.83	1.00	1.00	4.67	10.00
Bikini	13	107.5	6.00	1.00	4.67	1.00	8.80
	14	105.0	5.33	1.00	1.00	4.17	8.75
D85178	13	110.0	5.33	1.33	3.00	2.67	9.40
	14	102.0	5.17	1.00	1.67	3.00	8.65
D165250	13	100.0	5.17	1.00	3.00	2.67	9.40
	14	98.5	4.83	1.00	2.67	3.00	9.90
Oasis	13	100.5	5.33	1.00	3.00	2.67	8.40
	14	96.5	4.83	1.00	2.00	3.00	8.75
Acclaim	13	95.0	4.83	1.00	2.00	3.33	8.60
	14	95.5	4.83	1.00	1.33	3.67	10.15
Ambassador	13	92.5	5.00	1.00	2.33	3.67	9.30
	14	93.0	5.33	1.00	1.67	3.67	8.70

KEY: Uniformity; Uniformity; No. of blonds; Flavour; Texture: (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; Brix - measured using Atago pocket refractometer PAL-1 and gives an indication of sugar content

Varietal Susceptibility of Vining Peas to Downy Mildew (*Peronospora viciae*) - 2014

It is important that untreated seed is entered for trials so that downy mildew susceptibility can be evaluated.

As part of the variety evaluation work 31 varieties of vining peas were sown in disease observation trials at two locations in Lincolnshire. Both trials were situated in a field with a history of pea growing.

Plants were scored for infection on two 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.

Downy mildew levels were very low at both sites in 2014

Susceptible	Moderately Susceptible	Slightly Susceptible	Good Field Resistance
08570957	D85178	Payton	CS430AF
D165250	Olinda	Aloha	Kiss
	Jubilee	CS426AF	
	Maurice	D85410	

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

Discussion

Standard Pea Main Trial, Holbeach 2014 - Tables 1 & 2

None of the varieties were found to be unsuitable for UK production

Oasis replaced Bikini as the standard for yield in 2014 (both varieties have been in trial for a number of years). Oasis is a very high yielding variety and a consequence of this is that some varieties appear low yielding by comparison. Although this is less striking than at the Thornhaugh site.

Maturity was a little extended at this site: Bikini +11, Oasis +15 and Ambassador +17. Other varieties showed a similar pattern, but maturity is always judged against the later standards.

Yields from this site were exceptionally high. Oasis gave high yields, but Maurice gave similar yields. Gusty, as in 2013 gave yields similar to Oasis. CS 426 AF and D85410 yielded well at TR120.

Growth was vigorous at this site, but semi-leafless varieties Maurice and Standana had the better standing ability.

TWO YEAR SUMMARY – VARIETIES TESTED 2011 & 2013

A summary of varieties completing 2 years of trials in 2013 was presented in the year 2 annual report – February 2014

TWO YEAR SUMMARY – VARIETIES TESTED 2013 & 2014

Standard Size Varieties, Holbeach 2013 & 2014 - Tables 3 & 4

Varieties were evaluated in Standard Main Trials 2013 and 2014.

Seven varieties Papillon, Olinda, Jubilee, Gusty, D85178, D165250 and Acclaim completed 2 years of evaluation in 2014.

Papillon (Limagrain UK) matured 3 days later than Avola. Haulm was a little shorter than Avola and had similar standing ability. Yields were significantly lower than Oasis, but a little higher than Avola at TR100. Produce was large-medium size grade, a little smaller than Avola.

Olinda (FP2332) (Syngenta) matured 4 days later than Avola. Haulm was a little shorter than Avola and had similar standing ability. Yields were lower, but not significantly lower than Oasis. Produce was medium-large size grade, but with a large percentage in the medium size grade. Haul was shorter than Avola and had similar standing ability.

Jubilee (Limagrain UK) matured 5 days later than Avola. Yields were lower, but not significantly lower than Oasis. Produce was medium-large size grade, but with a large percentage in the medium size grade. Haulm was longer than Bikini and standing ability was similar.

Gusty (van Waveren) was semi-leafless and matured 6 days later than Avola. Yields of medium-large size grade peas were lower, but not significantly lower than Oasis. Haulm was longer than Bikini, but standing ability was similar.

D85178 (Syngenta) matured one day later than Bikini. Haulm was long, similar in length to Ambassador and standing ability was similar. Yields of medium size grade peas were lower, but not significantly lower than Oasis.

D165250 (Syngenta) was semi-leafless and matured 2 days later than Bikini. Yields were lower, but not significantly lower than Oasis. Peas were medium-large size grade, similar in size to Oasis. Haulm was shorter than Oasis and standing ability similar.

Acclaim (The New Zealand Institute for Plant and Food Research Ltd) matured at the same time as Ambassador, 13 days later than Avola. Yields were lower, but not significantly lower than Oasis. Produce was medium size grade. Haulm was a little shorter than Oasis.

Conclusions

Conclusions are drawn from a 2 year summary of varieties evaluated in 2013 & 2014.

Vining peas are a unique crop in terms of timely harvesting. Varietal selection is an important and key element of vining pea crop production to ensure a programmed harvest period and to maintain high quality.

Avola was the first variety to mature. Ambassador and Acclaim were the latest maturing 13 days later than Avola.

Avola and Papillon gave statistically significantly lower yields than Oasis.

Highest yielding variety was Oasis, followed by Ambassador and Gusty

Many of the varieties gave peas of large or medium-large size grade peas. Olinda, Jubilee, D85178 and Acclaim were a little smaller, giving mostly medium size grade peas. Papillon, Olinda, Jubilee, D85178, and Acclaim were moderately susceptible to downy mildew, while Gusto, D165250 and Acclaim were slightly susceptible to downy mildew.

The number of blond peas was generally greater in 2014 than 2013. Papillon, Bikini and Gusto gave high levels of blond peas on 2014 compared to low levels in 2013.

Industry representative comments

I consider information and findings of this project to be vital to the future profitability of the vining pea industry. It is very important that the industry has an independent and thorough evaluation of the numerous varieties coming on stream and this project is extremely good value.

Knowledge and Technology Transfer

No formal trials demonstration was held. However, an open invitation was sent out to view the trial at people's convenience.

The PGRO publication 'Vining Pea Growers Guide' was produced and distributed and contains 2 year summaries for varieties completing trials in 2008/9 or 2009/10, 2010/11, 2011 & 2013 and 2013/14. Data from other PGRO trials are also presented. This Publication is available free of charge and via the PGRO website.

Appendices

APPENDIX 1

KEY TO SOURCE OF VARIETIES

CS	Crites Seed Inc., USA
LUK	Limagrain UK Ltd, UK
Nun	Nunhems Zaden BV., Holland
PFR	Plant & Food Research, New Zealand
SVS	Seminis Vegetable Seeds, France
Syn	Syngenta Seeds SAS, France
vW	van Waveren, 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