

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

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PRACTICAL SECTION FOR GROWERS

Background

The PGRO evaluate a large number of varieties per each year including approximately 20 at National List Stage in Preliminary Trial and about 5 of the best ones are chosen for further evaluation in the 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 premium quality (TR100) and economy (TR120) peas. This dictates that the trials are only sown on one date (usually early to mid-March for the Main Trial and mid-March to 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 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 at least two years to gain experience in contrasting seasons. Early, early maincrop and maincrop varieties are needed to give a six week harvesting season and viner groups often use six or more in their sowing programmes.

Summary of results

Six early and second early (Avola, Cabree, Zamira, Point (1999 only), Jaguar, Tacoma) 10 early maincrop (Waverex, Paso, Jewel, Samish, Colana, Geneva, Griffin, Gemini, Snake, Favorit) and 6 maincrop (Puget, Balmoral, Brule, Oasis, Tyne, Pinnacle) varieties of vining peas were compared to Bikini for yield and maturity. Petits pois varieties were compared to Waverex, early varieties to Avola and later maturing varieties to Puget.

Early and Second Early Varieties - Table 1

Point was the highest yielding early variety in 1999, but the variety was withdrawn by the breeder for 2000.

Maturity of **Cabree** was variable, but overall matured one day later than Avola. Yields were lower than Avola at TR100, but similar at TR120. Produce was smaller than Avola, medium size grade.

Zamira also matured one day later than Avola and gave similar yields to Cabree at TR100.

Yields from second earlies **Jaguar** and **Tacoma** were a little lower than in previous trials.

Early Maincrop Varieties - Table 2

Samish matured one day before Bikini, a little earlier than expected. Yields were a little higher than Bikini and produce was similar in size.

Favorit yields were a little lower than expected. Produce was smaller than Bikini, medium-small size grade.

Geneva gave similar yields to Bikini, and produce was smaller, medium-small size.

Colana gave lower yields than in previous trials, but yields of medium size grade peas were similar to Bikini at TR120.

Semi-leafless **Gemini** gave medium size grade, evenly coloured peas, but yields were low.

Griffin gave slightly higher yields than expected, similar to Bikini. Peas were medium-large size grade, a little larger than Bikini.

Semi-leafless Snake gave excellent yields of similar size grade peas to Bikini.

Petits pois varieties **Jewel** and semi-leafless **Paso** gave peas a little smaller than Waverex, but yields were a little lower than Waverex. Paso had a dark, uniform colour. Jewel matured 2 days before Bikini, a little earlier than expected.

Maincrop Varieties - Table 3

Yields in this trial were much higher in 2000, with varieties benefiting from cooler and wetter conditions

Semi-leafless **Brule** matured at the same time as Puget. Yields were similar to expected, significantly lower than Bikini at TR100, but peas were smaller, medium size grade.

Balmoral gave yields were lower yields than Bikini, but not significantly so. Produce was a little smaller than Bikini, medium-large size grade .

Semi-leafless **Pinnacle** was a little higher yielding than Bikini and produce was smaller, medium size grade with a good, uniform colour.

Oasis gave excellent yields in both years and matured 2 days later than Puget. Produce was medium-large size grade.

Tyne was semi-leafless and gave lower than expected yields, significantly lower than Bikini. Produce was smaller than Bikini, medium size grade

Key Points

- Paso and Jewel were two petits pois alternatives to Waverex.
- Cabree, although not as high yielding as Avola in this trial series has much smaller produce.
- High yields have been confirmed from early maincrop varieties Snake and Samish and from maincrop Oasis

Potential benefits

The project should appeal to growers, giving additional information on relative maturity and field performance of commercially relevant vining pea varieties. New vining pea varieties in trial represent improvements in yield, size-grade and uniformity compared with varieties such as Avola and Scout (no longer used in trials) which have been grown for very many years. Information on maturity is particularly important to allow new varieties to be correctly integrated into drilling and harvesting programmes. 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. The use of semi-leafless and fine foliated varieties may help in this respect

This work should benefit all vining pea growers interested in development of new improved varieties.

The data will provide valuable additional information for the growers leaflet 'Vining pea varieties: a descriptive list'

TABLE 1 - VINING PEA VARIETY STUDIES.

Summary of agronomic data - Established Variety Trial - Early & Second Earlies, Thornhaugh - 1999 - 2000

Varieties placed in order of maturity. Standard varieties underlined.

Target population 90 plants per m² sown in ten 15 cm rows

Variety	Source	@TR100							@TR120								
		Seeds /Kg (\pm days) Bikini	Maturity (\pm days) Bikini	Yield % of Bikini	% in size grades				Maturity (\pm days) Bikini	Yield % of Bikini	% in size grades				Haulm length cm	as % of total weight	colour 1=pale 6=v.dark
					L	M	S	VS			L	M	S	VS			
<u>Avola</u>	<u>As</u>	<u>3650</u>	<u>-10</u>	<u>79⁺</u>	<u>44</u>	<u>41</u>	<u>13</u>	<u>2</u>	<u>-10</u>	<u>73</u>	<u>59</u>	<u>31</u>	<u>8</u>	<u>2</u>	<u>52</u>	<u>17</u>	<u>4.5</u>
Cabree	As	5240	- 9	62 ⁻	28	47	20	5	-10	71 ⁻	32	49	15	4	47	15	4.5
Zamira	Nun	4508	- 9	65 ⁻	43	39	15	3	- 9	58 ⁻	57	35	6	2	52	16	5.5
Jaguar	Sh	5780	- 4	66 ⁻	35	43	18	4	- 5	81	41	43	13	3	48	19	5.0
Tacoma (SL)	As	6024	- 3	74 ⁻	19	40	30	11	- 3	70	27	49	20	5	49	16	4.5
<u>Bikini</u>	<u>(SL/SF) S&G</u>	<u>5252</u>	<u>0</u>	<u>100</u>	<u>40</u>	<u>45</u>	<u>13</u>	<u>2</u>	<u>0</u>	<u>100</u>	<u>54</u>	<u>37</u>	<u>7</u>	<u>2</u>	<u>46</u>	<u>17</u>	<u>5.0</u>
				(6.99t/ha)						(8.20t/ha)							
Significance @ P=0.05				SD						SD							
LSD @ P=0.05				10.0						10.3							
CV %				3.1						3.2							

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 2 - VINING PEA VARIETY STUDIES.

Summary of agronomic data - Established Variety Trial - Early Maincrops, Thornhaugh - 1999 - 2000

Varieties placed in order of maturity. Standard varieties underlined.

Target population 90 plants per m² sown in ten 15 cm

Variety	Source	@TR100							@TR120								
		Seeds /Kg	Maturity (± days)	Yield % of Bikini	% in size grades				Maturity (± days)	Yield % of Bikini	% in size grades				Haulm length cm	as % of total weight	colour 1=pale 6=v.dark
			Bikini	Bikini	L	M	S	VS	Bikini	Bikini	L	M	S	VS	cm	weight	
Jewel	Sh	7105	- 2	40 ⁻	1	9	47	43	- 2	41 ⁻	1	13	57	29	59	8	4.0
Samish	CM	4598	- 1	108	32	50	15	3	- 1	116	39	47	11	2	67	20	5.0
<u>Bikini</u>	<u>(SL/SF) S&G</u>	<u>5252</u>	<u>0</u>	<u>100</u>	<u>30</u>	<u>47</u>	<u>18</u>	<u>5</u>	<u>0</u>	<u>100</u>	<u>41</u>	<u>48</u>	<u>10</u>	<u>1</u>	<u>49</u>	<u>18</u>	<u>5.0</u>
				(6.53t/ha)						(7.00t/ha)							
Paso	(SL) As	8637	+ 1	57 ⁻	1	13	45	41	+ 1	54 ⁻	2	21	53	24	61	12	5.0
<u>Waverex</u>	<u>vW</u>	<u>8595</u>	<u>+1</u>	<u>64⁻</u>	<u>2</u>	<u>19</u>	<u>43</u>	<u>36</u>	<u>+1</u>	<u>68⁻</u>	<u>3</u>	<u>24</u>	<u>51</u>	<u>22</u>	<u>51</u>	<u>14</u>	<u>4.0</u>
Favorit	AGIS	6118	+ 1	86	15	48	31	6	+ 2	96	19	55	22	4	68	16	4.5
Colana	Nun	5617	+ 2	91	24	51	21	4	+ 2	100	32	54	13	1	63	16	5.0
Griffin	Sh	4990	+ 2	103	40	49	10	1	+ 2	98	48	45	6	1	65	18	5.0
Geneva	Nun	6235	+ 2	97	19	50	26	5	+ 2	106	25	56	17	2	64	19	5.0
Gemini	(SL) Sh	5250	+ 4	79	22	57	18	3	+ 3	76	30	60	9	1	72	14	5.0
Snake	(SL) CM	5092	+ 5	136 ⁺	36	50	12	2	+ 5	133 ⁺	48	47	4	1	60	22	5.0
Significance @ P=0.05				SD						SD							
LSD @ P=0.05				24.4						28.8							
CV %				12.5						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

TABLE 3 - VINING PEA VARIETY STUDIES.

Summary of agronomic data - Established Variety Trial - Maincrops, Thornhaugh - 1999 - 2000

Varieties placed in order of maturity. Standard varieties underlined.

Target population 90 plants per m² sown in ten 15 cm

Variety	Source	@TR100							@TR120									
		Seeds /Kg (± days) Bikini	Maturity (± days) Bikini	Yield % of Bikini	% in size grades				Maturity (± days) Bikini	Yield % of Bikini	% in size grades				Haulm length cm	as % of total weight	colour 1=pale 6=v.dark	
					L	M	S	VS			L	M	S	VS				
<u>Bikini</u>	<u>(SL/SF) S&G</u>	<u>5252</u>	<u>0</u>	<u>100</u> (6.50t/ha)	<u>30</u>	<u>49</u>	<u>19</u>	<u>2</u>	<u>0</u>	<u>100</u> (6.83t/ha)	<u>37</u>	<u>49</u>	<u>12</u>	<u>2</u>	<u>47</u>	<u>17</u>	<u>5.0</u>	
<u>Puget</u>	<u>Bro</u>	<u>5184</u>	<u>+2</u>	<u>97</u>	<u>30</u>	<u>50</u>	<u>17</u>	<u>3</u>	<u>+2</u>	<u>106</u>	<u>44</u>	<u>47</u>	<u>8</u>	<u>1</u>	<u>57</u>	<u>17</u>	<u>4.5</u>	
Brule	(SL) CM	5806	+2	82 ⁻	18	47	29	6	+2	92	21	54	22	3	68	14	5.0	
Balmoral	Sh	5541	+2	86	26	47	23	4	+2	94	29	52	17	2	62	18	5.0	
Pinnacle	(SL) Sh	5971	+3	106	15	53	28	4	+3	107	19	58	20	3	79	18	4.5	
Oasis	Sh	5576	+3	115	32	49	16	3	+3	125 ⁺	38	49	11	2	62	22	4.5	
Tyne	(SL) CM	6172	+5	78 ⁻	20	53	24	3	+5	76 ⁻	26	62	11	1	76	14	5.0	
Significance @ P=0.05				SD					SD									
LSD @ P=0.05				17.2					9.1									
CV %				7.4					3.7									

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

SCIENCE SECTION

Introduction

The PGRO evaluate a large number of varieties per each year including approximately 20 at National List Stage in Preliminary Trial and about 5 of the best ones are chosen for further evaluation in the 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 premium quality (TR100) and economy (TR120) peas. This dictates that the trials are only sown on one date (usually early to mid-March for the Main Trial and mid-March to 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 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 at least two years to gain experience in contrasting seasons. Early, early maincrop and maincrop varieties are needed to give a six week harvesting season and viner groups often use six or more in their sowing programmes.

This work should benefit all vining pea growers interested in development of new improved varieties.

Information for the grower for new vining pea varieties sown at appropriate timings for each group, early/second early, early maincrop and maincrop.

1. Yield relative to the standard
2. Maturity relative to the standard
3. Size-grade
4. Haulm length

Methods

Vining peas (*Pisum sativum* L.) were grown according to best commercial practice.

Bikini was used as the yield & maturity standard throughout the three trials in each year.

Maturity standard for each group underlined.

Sown:	15 March 1999	8 April 1999	27 April 1999
	6 March 20007	April 2000	28 April 2000
Group:	first/second early	early maincrop	maincrop
	<u>Avola</u>	<u>Bikini</u>	<u>Puget</u>
	<u>Bikini</u>	<u>Waverex</u>	<u>Bikini</u>
	Cabree	Paso	Balmoral
	Zamira	Jewel	Brule
	Point (1999 only)	Samish	Oasis
	Jaguar	Colana	Tyne
	Tacoma	Geneva	Pinnacle
		Griffin	
		Gemini	
		Snake	
		Favorit	

Site: sandy loam soil at Thornhaugh, Cambridgeshire in a vining pea growing area.

Trial layout: Randomised complete block, 3 replications.

Plot size: 1.83 m x 19 m

Sub-plots: 1.83 m x 5 m for each of three harvest taken at practical quick-freezing stage (Tenderometer (TR) value 100), canning stage (TR120) and a third harvest

Sampling areas for TR assessment: 1.83 m x 2 m

Seed of all varieties was treated to control damping off, downy mildew (*Peronospora viciae*) and *Ascochyta* diseases.

Plots were sown with an Øyjord plot drill (10 rows per plot and 15cm row width) to achieve a target population of 90 plants/m² and immediately rolled.

In 1999 broad-leaved weeds were controlled pre-emergence with Opogard (terbutryn/terbuthylazine), Early and Second Early Trial or Reflex T (fomesafen/terbutryn), Early Maincrop and Maincrop Trials, and post-emergence with Pulsar + Fortrol (bentazone/MCPB + cyanazine), all trials.

In 2000 broad-leaved weeds in the Early and Maincrop trials were controlled pre-emergence with Reflex T and for the Early trial post-emergence with Pulsar + Fortrol. The Early Maincrop trial received only Pulsar + Fortrol post-emergence. All trials received Laser (cycloxdim) + Actipron to control grass weeds.

In both years weevil and field thrips (*Thrips angusticeps*) were few in number and caused little damage. Aphid (*Acyrtosiphon pisum*) and pea moth (*Cydia nigricana*) were controlled with a single application of Aphox (pirimicarb) and Hallmark (lambda-cyhalothrin). The Maincrop Trial in 1999 received a second spray of Aphox.

Foliar diseases *Botrytis* and *Mycosphaerella* were controlled with Bravocarb (chlorothalonil + carbendazim).

No irrigation was applied.

Haulm lengths of 5 random plants per plot were measured before harvest and a mean given for each variety.

Dates of flowering were recorded and maturity was assessed (using a Martin Pea Tenderometer) from the sampling areas to achieve the correct harvest date for quick-freezing for vined peas.

Sub-plots were harvested by hand, vined in a static plot pea viner, sieved and washed. Peas were size-graded with a rotating Mather & Platt size-grader, and weighed and total yield measured. Percentages in each size grade were calculated from the weights and given as a mean for each variety.

Yields of vined peas were statistically analysed using analysis of variance.

After bulking the size grades Tenderometer readings were taken.

Samples for each variety in the Tenderometer range 95-105 were blanched, sorted to remove extraneous matter and quick-frozen in a blast freezer. Samples were stored at below -18°C.

Results

1999 season

Rainfall in February was average, but March was wetter than the long-term average. Rainfall during April, May and June was near to normal in total, but the second half of June was very dry. July was also very dry receiving only 10.4% of the long-term average rainfall. Apart from a cooler week in mid-February, the period from the second half of December to mid-March was warmer than average. The third week in April and the second week in June were cooler than normal, otherwise temperatures during April, May, June and July were above normal for the time of year.

Sowing of the Early Trial was delayed because of wet conditions, but conditions at drilling time were good, and the peas emerged well and evenly, with no field losses.

Harvest started on 21 June with Avola in the Early Trial and was completed on 22 July with Oasis and Tyne in the Maincrop Trial. At harvest peas matured slowly at the start of the season, but as temperatures increased throughout July and with a lack of moisture, maturity was rapid.

2000 Season

Temperatures were well above average for February and March, but rainfall for March was only 35% of the long-term average. April received more than three times the average rainfall and temperatures were below average for the time of year. May was again a wet month, but with higher than average temperatures. June was a very dry month, with some very hot days during the third week when temperatures reached nearly 30° C. July was cooler and wetter than average.

The vining pea harvest started on 20 June and was completed on 31 July. The peas matured rapidly at the start of the season, but were slower to mature during wetter and cooler conditions in July.

Early and Second Early Varieties - Table 1

Point was withdrawn from the trials by the breeder after the first year.

In 2000 Zamira was heavily infected with seed borne *Ascochyta pisi* and Avola showed symptoms of pea bacterial blight (*Pseudomonas syringae*) infection. Infections spread to Cabree, which was adjacent to these 2 varieties. Yield results for 2000 were therefore not used in the overall yield analysis.

Avola matured 10 days before Bikini and gave significantly lower yields than Bikini at TR100. Produce was large size grade and uneven in size. Peas had a bright, but uneven colour 1999. Peas were of uniform colour in 2000

Cabree matured one day later than Avola, but in 1999 Cabree matured later than expected, 3 days later than Avola. Previous trials had shown Cabree to be higher yielding than Avola, but in this series Cabree was lower yielding at TR100 and gave similar yields at TR120. Produce was a little larger than expected, but smaller than Avola, medium size grade, with a good, dark and even colour in both years.

Like Cabree, **Zamira** also matured a little later than expected in 1999, but maturity was also one day later than Avola. Yields were similar to Cabree, a little lower than in previous trials. Produce was large size grade and had uniform colour in both years.

Second early **Jaguar** matured a little earlier than expected, 4 days before Bikini. Yields were lower than Bikini and a little lower than previous trials. Produce was a little larger than expected, medium-large size grade, but size was uneven. Pea colour was uneven in both years and there were a few blond peas in the processed sample in 1999.

Semi-leafless **Tacoma** stood well and matured 3 days before Bikini, a little earlier than expected. Yields were lower than Bikini, a little lower than previous trials. Peas were medium-small size grade and had a bright, even colour.

Bikini was semi-leafless and semi-fasciated and matured 10 days later than Avola (normally +7). Yields in 2000 were much higher than 1999. Peas were medium-large size grade and evenly coloured.

Early Maincrop Varieties - Table 2

Petis Pois Varieties

Waverex the petits pois standard matured one day later than Bikini and gave similar yields to previous trials, significantly lower than Bikini. Produce was very small, with 79% of the peas <8.75mm diameter. Pea colour was a little uneven in both years.

Jewel, usually the same maturity as Bikini, matured 1-2 days earlier in these trials. Yields were lower than Waverex and a little lower than expected. Produce was very small, a little smaller than Waverex, with 90% of the peas <8.75mm diameter. Jewel had fine foliage and haulm was a little longer than Waverex.

Maturing at the same time as Waverex, semi-leafless **Paso** had longer haulm than Waverex and stood erect. Yields were a little lower than Waverex. Produce was evenly coloured and a little smaller than Waverex, with 86% of the peas <8.75mm diameter.

Standard Size Varieties

Previously **Samish** has matured 2 days later than Bikini, but was one day earlier in this trial series. Yields overall were higher than Bikini, but statistically, not significantly higher. Samish had long haulm and lodged, but pods were held clear of the ground. Produce was medium-large size grade, uneven in colour in both years and in 1999 there were blond peas in the processed sample.

Bikini gave good yields, a little higher than in the early sown trial. Produce was medium-large size grade and had uniform colour.

Favorit had long haulm, but relatively fine foliage and matured one day later than **Bikini**, a little earlier than expected. Yields at TR120 were similar to previous trials, but were lower at TR100. Produce was smaller than **Bikini**, medium-small size grade, but peas had uneven colour and there were blond peas in the 1999 processed sample.

Colana, **Griffin** and **Geneva** matured as expected 2 days later than **Bikini**.

Yields from **Colana** were similar to **Bikini** at TR100 in previous trials. Yields were lower, but not significantly lower than **Bikini** in this trial series, a little lower than previous trials. Yields at TR120 were similar to **Bikini**. Produce was medium size grade, with a bright, but slightly uneven colour

Griffin gave slightly higher yields than expected, similar to **Bikini**. Peas were medium-large size grade, a little larger than **Bikini**. Produce was uneven in colour and there were a few blond peas in the processed sample in 1999.

Geneva gave similar yields to **Bikini** and gave smaller, medium-small size grade peas. Peas were a little uneven in colour in both years.

Maturing 4 days later than **Bikini**, **Gemini** was semi-leafless, with long haulm, but stood erect. Overall, yields were lower than **Bikini**, but produce was smaller, medium size grade and had a dark, even colour.

Snake was semi-leafless, stood well and matured 5 days later than **Bikini**. **Snake** performed better than in previous trials and was the outstanding early maincrop variety for yield, giving significantly higher yields than **Bikini** in both years. Produce was medium-large size grade (similar to **Bikini**), with a dark and even colour.

Maincrop Varieties - Table 3

Yields in 2000 were much higher than in the 1999 trial, with varieties benefiting from cooler and wetter conditions.

Bikini was the first variety to mature in this late sown trial. **Bikini** gave good yields of medium-large size grade, dark and evenly coloured peas.

Puget normally matures 5 days later than **Bikini**, but matured only 2 days later in this trial series. Yields and size grades were similar to **Bikini**. Peas were a little uneven in colour in both years.

Brule matured at the same time as **Puget** (normally one day earlier). **Brule** was semi-leafless and stood erect. Yields were similar to expected, significantly lower than **Bikini** at TR100. Peas were smaller than **Bikini**, medium size grade, with a dark and even colour.

Balmoral matured at the same time as **Puget** (normally one day later). Yields were lower than **Bikini**, but not significantly so. Produce was smaller than **Bikini**, medium-large size grade with uneven colour and there were a few blond peas in the processed sample in 1999.

Pinnacle matured one day later than **Puget**. **Pinnacle** was semi-leafless with very long haulm, but stood well. Yields at TR100 in 1999 were significantly higher than **Bikini** and overall were a little higher than **Bikini**. Produce was smaller than **Bikini**, medium size grade, with a good, bright and uniform colour.

Oasis matured one day later than Puget (normally one day earlier). Yields were the highest of the maincrop varieties in both years, confirming previous trial results. Yields were significantly higher than Bikini at TR120. Produce was similar in size to Bikini, medium-large size grade, but colour was not as uniform as Bikini.

Maturing 3 days later than Puget (usually +2), **Tyne** was semi-leafless with long haulm, but stood well. Yields were lower than expected and were significantly lower than Bikini. Produce was smaller than Bikini, medium size grade. In 1999 peas had a bright, but uneven colour and there were few blond peas in the processed sample. In 2000 peas had a dark and uniform colour.

TECHNOLOGY TRANSFER

Trials were demonstrated at PGRO members day held in June of both years. Frozen samples of produce were available for inspection at PGRO processors day held in November of both years. Yearly results were published in the PGRO processors day guide in each year and in PGRO technical manual No.1: vining and combining peas. The 2000 technical manual will also contain 2 year summaries. Results from the first year were incorporated into the PGRO publication: Advisory leaflet on Vining Pea Varieties, published November 1999. A further update to include 2000 results is planned for November 2001. The main points of the 1999 advisory leaflet were presented to a meeting of the Vegetable Agronomist Association (VAA) in November 1999. Results from the 2000 trials were presented to the VAA in November 2000. A review of the 1999 Advisory leaflet was reported in the PGRO publication Pea & Bean Progress, Published winter 1999. A summary of two year results was published in Pea & Bean Progress in Winter 2000.

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 varieties to be correctly integrated into drilling and harvesting programmes.

Information from the trials in 1999 has been incorporated into the data used to produce the PGRO advisory leaflet on vining pea varieties updated November 1999, a leaflet used extensively by growers, processors and merchants. Data from the 2000 trials will be incorporated into the next update planned for November 2001.

TABLE 1 - VINING PEA VARIETY STUDIES.

Summary of agronomic data - Established Variety Trial - Early & Second Earlies, Thornhaugh - 1999 - 2000

Varieties placed in order of maturity. Standard varieties underlined.

Target population 90 plants per m² sown in ten 15 cm rows

Variety	Source	@TR100							@TR120								
		Seeds /Kg (\pm days) Bikini	Maturity \pm days	Yield % of Bikini	% in size grades				Maturity (\pm days) Bikini	Yield % of Bikini	% in size grades				Haulm length cm	as % of total weight	colour 1=pale 6=v.dark
<u>Avola</u>	<u>As</u>	<u>3650</u>	<u>-10</u>	<u>79⁺</u>	<u>44</u>	<u>41</u>	<u>13</u>	<u>2</u>	<u>-10</u>	<u>73</u>	<u>59</u>	<u>31</u>	<u>8</u>	<u>2</u>	<u>52</u>	<u>17</u>	<u>4.5</u>
Cabree	As	5240	-9	62 ⁻	28	47	20	5	-10	71 ⁻	32	49	15	4	47	15	4.5
Zamira	Nun	4508	-9	65 ⁻	43	39	15	3	-9	58 ⁻	57	35	6	2	52	16	5.5
Jaguar	Sh	5780	-4	66 ⁻	35	43	18	4	-5	81	41	43	13	3	48	19	5.0
Tacoma (SL)	As	6024	-3	74 ⁻	19	40	30	11	-3	70	27	49	20	5	49	16	4.5
<u>Bikini</u>	<u>(SL/SF) S&G</u>	<u>5252</u>	<u>0</u>	<u>100</u>	<u>40</u>	<u>45</u>	<u>13</u>	<u>2</u>	<u>0</u>	<u>100</u>	<u>54</u>	<u>37</u>	<u>7</u>	<u>2</u>	<u>46</u>	<u>17</u>	<u>5.0</u>
				(6.99t/ha)						(8.20t/ha)							
Significance @ P=0.05				SD						SD							
LSD @ P=0.05				10.0						10.3							
CV %				3.1						3.2							

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 2 - VINING PEA VARIETY STUDIES.

Summary of agronomic data - Established Variety Trial - Early Maincrops, Thornhaugh - 1999 - 2000

Varieties placed in order of maturity. Standard varieties underlined.

Target population 90 plants per m² sown in ten 15 cm

Variety	Source	@TR100							@TR120								
		Seeds /Kg	Maturity (± days)	Yield % of Bikini	% in size grades				Maturity (± days)	Yield % of Bikini	% in size grades				Haulm length cm	as % of total weight	colour 1=pale 6=v.dark
		(± days)	Bikini	Bikini	L	M	S	VS	Bikini	Bikini	L	M	S	VS	cm	weight	
Jewel	Sh	7105	- 2	40 ⁻	1	9	47	43	- 2	41 ⁻	1	13	57	29	59	8	4.0
Samish	CM	4598	- 1	108	32	50	15	3	- 1	116	39	47	11	2	67	20	5.0
<u>Bikini</u>	<u>(SL/SF) S&G</u>	<u>5252</u>	<u>0</u>	<u>100</u>	<u>30</u>	<u>47</u>	<u>18</u>	<u>5</u>	<u>0</u>	<u>100</u>	<u>41</u>	<u>48</u>	<u>10</u>	<u>1</u>	<u>49</u>	<u>18</u>	<u>5.0</u>
				(6.53t/ha)						(7.00t/ha)							
Paso	(SL) As	8637	+ 1	57 ⁻	1	13	45	41	+ 1	54 ⁻	2	21	53	24	61	12	5.0
<u>Waverex</u>	<u>vW</u>	<u>8595</u>	<u>+1</u>	<u>64⁻</u>	<u>2</u>	<u>19</u>	<u>43</u>	<u>36</u>	<u>+1</u>	<u>68⁻</u>	<u>3</u>	<u>24</u>	<u>51</u>	<u>22</u>	<u>51</u>	<u>14</u>	<u>4.0</u>
Favorit	AGIS	6118	+ 1	86	15	48	31	6	+ 2	96	19	55	22	4	68	16	4.5
Colana	Nun	5617	+ 2	91	24	51	21	4	+ 2	100	32	54	13	1	63	16	5.0
Griffin	Sh	4990	+ 2	103	40	49	10	1	+ 2	98	48	45	6	1	65	18	5.0
Geneva	Nun	6235	+ 2	97	19	50	26	5	+ 2	106	25	56	17	2	64	19	5.0
Gemini	(SL) Sh	5250	+ 4	79	22	57	18	3	+ 3	76	30	60	9	1	72	14	5.0
Snake	(SL) CM	5092	+ 5	136 ⁺	36	50	12	2	+ 5	133 ⁺	48	47	4	1	60	22	5.0
Significance @ P=0.05				SD						SD							
LSD @ P=0.05				24.4						28.8							
CV %				12.5						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 3 - VINING PEA VARIETY STUDIES.

Summary of agronomic data - Established Variety Trial - Maincrops, Thornhaugh - 1999 - 2000

Varieties placed in order of maturity. Standard varieties underlined.Target population 90 plants per m² sown in ten 15 cm

Variety	Source	@TR100							@TR120									
		Seeds /Kg (\pm days) Bikini	Maturity (\pm days) Bikini	Yield % of Bikini	% in size grades				Maturity (\pm days) Bikini	Yield % of Bikini	% in size grades				Haulm length cm	as % of total weight	colour 1=pale 6=v.dark	
<u>Bikini</u>	<u>(SL/SF) S&G</u>	<u>5252</u>	<u>0</u>	<u>100</u> (6.50t/ha)	<u>30</u>	<u>49</u>	<u>19</u>	<u>2</u>	<u>0</u>	<u>100</u> (6.83t/ha)	<u>37</u>	<u>49</u>	<u>12</u>	<u>2</u>	<u>47</u>	<u>17</u>	<u>5.0</u>	
<u>Puget</u>	<u>Bro</u>	<u>5184</u>	<u>+2</u>	<u>97</u>	<u>30</u>	<u>50</u>	<u>17</u>	<u>3</u>	<u>+2</u>	<u>106</u>	<u>44</u>	<u>47</u>	<u>8</u>	<u>1</u>	<u>57</u>	<u>17</u>	<u>4.5</u>	
Brule	(SL) CM	5806	+2	82 ⁻	18	47	29	6	+2	92	21	54	22	3	68	14	5.0	
Balmoral	Sh	5541	+2	86	26	47	23	4	+2	94	29	52	17	2	62	18	5.0	
Pinnacle	(SL) Sh	5971	+3	106	15	53	28	4	+3	107	19	58	20	3	79	18	4.5	
Oasis	Sh	5576	+3	115	32	49	16	3	+3	125 ⁺	38	49	11	2	62	22	4.5	
Tyne	(SL) CM	6172	+5	78 ⁻	20	53	24	3	+5	76 ⁻	26	62	11	1	76	14	5.0	
Significance @ P=0.05				SD					SD									
LSD @ P=0.05				17.2					9.1									
CV %				7.4					3.7									

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

REFERENCES

PGRO Processors Day Guide November 1999

PGRO Processors Day Guide November 2000

PGRO Vining Pea Varieties: advisory leaflet November 1999

PGRO Information Sheet 142: The choice of herbicides for spring peas revised February 2000

APPENDIX 1

KEY TO SOURCE OF VARIETIES

<u>CODE</u>	<u>NAME & ADDRESS</u>	<u>COUNTRY</u>
AGIS	AGIS P.O. Box 1162 D-3400 Gottingen	Germany
As	Asgrow Research Center PO Box 1235 Twin Falls Idaho. 83834.	USA
Bro	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
Nun	Nunhem Zaden BV Postbus 4005 6080 AA Haalen	Holland
PLS	Pure Line Seeds Inc. P.O. Box 8866 Moscow Idaho 83843	USA
S&G	Novartis Seeds S.A. 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

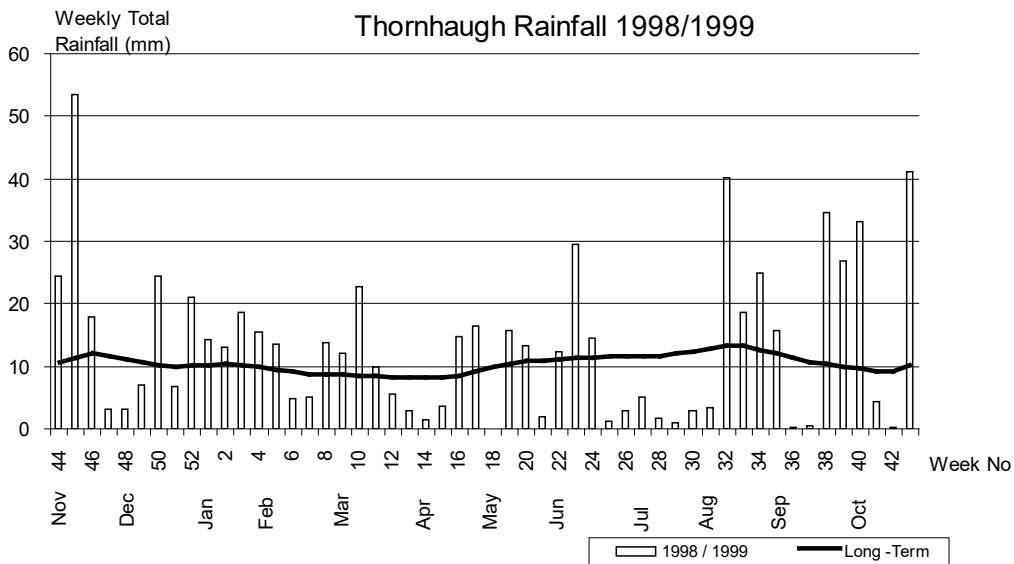
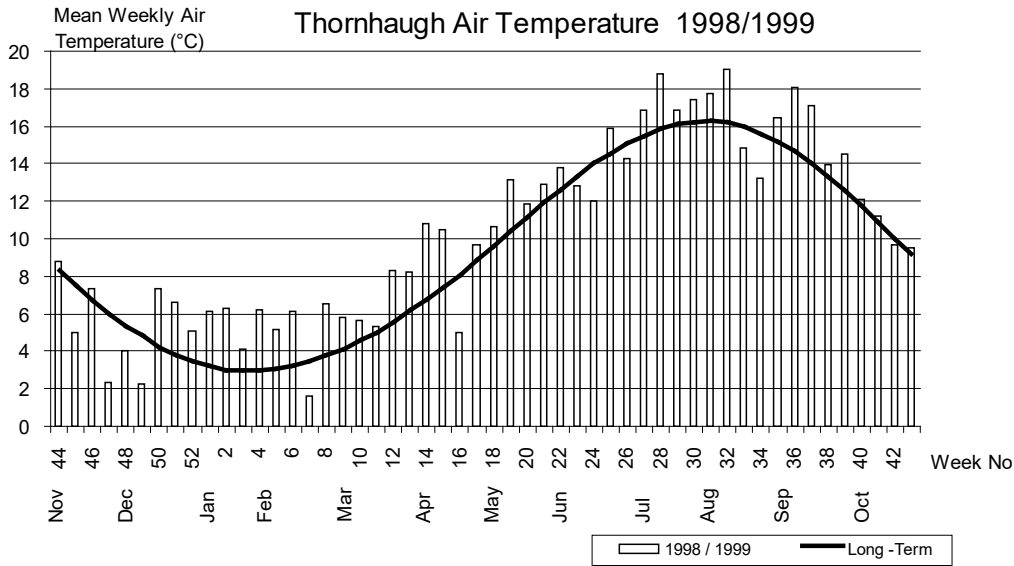
All samples were sorted to remove damaged or diseased produce and extraneous matter, washed and then blanched in water of 6° hardness. After cooling in tap water and further sorting the samples were packed for freezing.

The processing details for vining peas are given below:-

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

APPENDIX 3

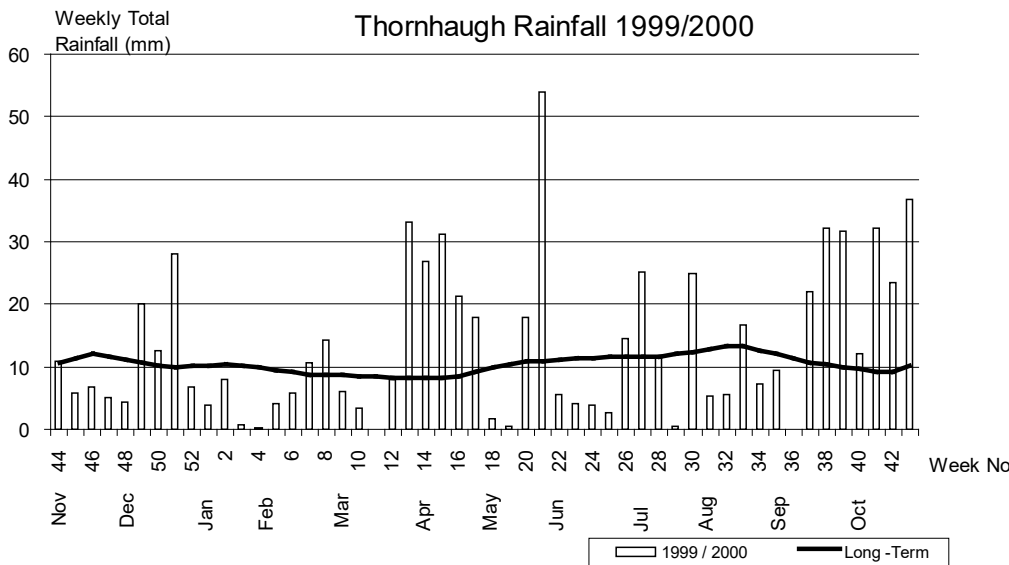
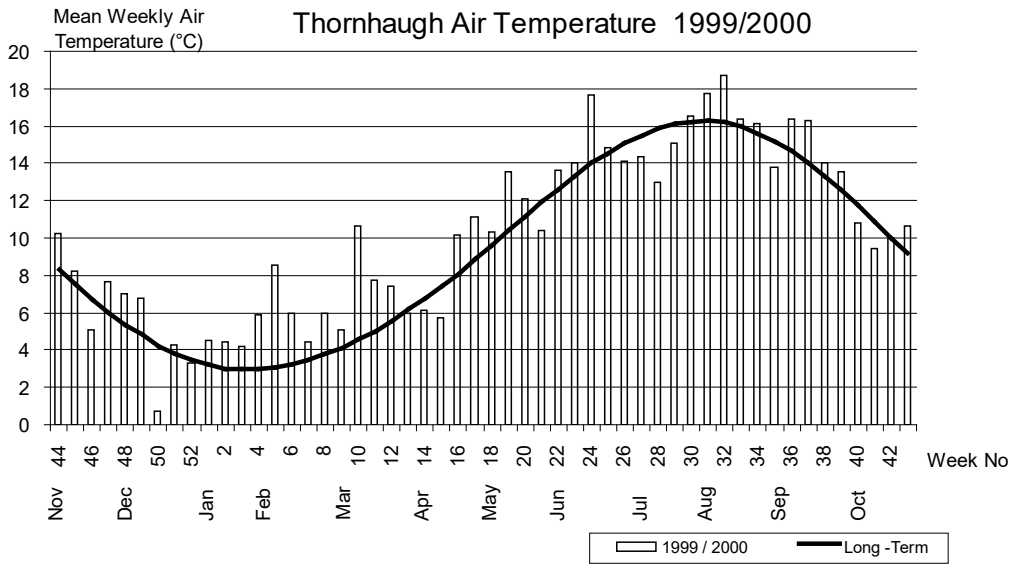
METEOROLOGICAL DATA 1999 SEASON



Month	1998/1999 Monthly Rainfall (mm)	Long-Term Average Rainfall (mm)	% of Average
November	73.0	51.5	141.7
December	58.0	40.8	142.2
January	73.0	45.3	161.1
February	36.0	35.7	100.8
March	42.0	37.7	111.4
April	35.6	38.9	91.5
May	43.6	42.8	101.9
June	50.8	51.4	98.8
July	10.4	54.1	19.2
August	100.8	57.8	174.4
September	70.8	42.3	167.4
October	72.8	43.6	167.0

APPENDIX 4

METEOROLOGICAL DATA 2000 SEASON



Month	1999/2000 Monthly Rainfall (mm)	Long-Term Average Rainfall (mm)	% of Average
November	29.6	51.5	57.5
December	68.4	40.8	167.6
January	13.1	45.3	28.9
February	40.6	35.7	113.7
March	13.3	37.7	35.3
April	128.6	38.9	330.6
May	78.8	42.8	184.1
June	12.8	51.4	24.9
July	75.0	54.1	138.6
August	43.6	57.8	75.4
September	85.0	42.3	200.9
October	106.4	43.6	244.0