

Processors & Growers Research Organisation



PROCESSORS' DAY
GUIDE

1996

**The Research Station
Great North Road, Thornhaugh
Peterborough PE8 6HJ**

Tel: Stamford (01780) 782585

CONTENTS

	<u>PAGE</u>
Introduction & Welcome	1
Weather for the 1996 Season	1
Programme & PCRO Staff	2
Summary of Vining Pea Variety Trials	3- 8
Vining Pea Main Variety Trial Results, Thornhaugh	Table 1 9
Vining Pea Preliminary Variety Trial Results, Thornhaugh	Table 2 10
Vining Pea Screening Variety Trial Results, Thornhaugh	Table 3 11-12
Summary of Combining Pea Variety Trials	13-18
Combining Pea Recommended List Variety Trial Results, Thornhaugh	Table 4 19
Combining Pea Recommended List Variety Trial Results, Chatteris	Table 5 20
Combining Pea Preliminary Variety Trial Results, Thornhaugh	Table 6 21
Combining Pea Screening Variety Trial Results, Thornhaugh	Table 7 22-23
Combining Pea Winter Pea Variety Trial Results, Thornhaugh	Table 8 24
Summary of Green Bean Variety Trials	25-27
Green Bean Main Variety Trial Results, Thornhaugh	Table 9 28
Green Bean Preliminary Variety Trial Results, Thornhaugh	Table 10 29
Green Bean Machine Harvesting Results, Thornhaugh	Table 11 30
Summary of Broad Bean Variety Trial	31-32
Broad Bean Variety Trial Results, Thornhaugh	Table 12 33
Processing Details for Canned and Frozen Samples	34-35
Appendix 1 - Key to Source of Varieties	35-36

PROCESSORS DAY

7 NOVEMBER 1996

PROGRAMME

Vegetable processing seems to be one of the most vulnerable areas of farming to production cycles and this has to be a cause of concern to producers, processors and retailers. Whilst production and marketing personnel grapple with the present depressing situation, one important aspect relates directly to PGRO work. This is that product quality is important, and that often high quality crops can be produced at little additional cost over 'economy' or 'value' samples. Here choice of variety is of paramount importance, for varietal characteristics affect the size, colour, flavour and texture of peas and beans.

Processors' Day allows the demonstration of the canned and frozen produce of over 100 pea and bean varieties. Together with the agronomic information recorded from trials at Thornhaugh and elsewhere, it provides the ideal backdrop to the selection of peas and beans to grow in 1997.

We hope that you have an enjoyable and useful day and that we will continue to work together in all aspects of pea and bean production.

October 1996

G. P. Gent
Director

WEATHER FOR THE 1996 SEASON

Following a very wet autumn, rainfall for January was a little below normal and above average for February. The period from March to the end of July received only 56% of the long-term average rainfall.

Average weekly air temperatures during the first two weeks of December were below normal. The third week of December was bitterly cold with mean weekly temperatures below zero. Temperatures then rose and were above normal for the end of December and first half of January. The second half of January was again very cold with mean temperatures below zero for these two weeks. Temperatures remained below normal until the first week of April. The middle two weeks of April were a little warmer than average. The last week of April and the first two weeks of May were again cooler than normal. The first half of June was a little warmer than normal, but cooler during the second half. Temperatures were a little higher than normal during July.

Field thrips and weevil were active during the early part of the growing season. Fungal diseases were negligible in pea crops, but there were some aphid infestations.

Silver Y (*Autographa gamma*) caterpillars were a problem in some areas in late drilled crops.

The vining pea harvest started on the 25th June. The varieties initially matured slowly, but maturity was more rapid towards the end of the season.

Combining started on the 15th July with autumn sown varieties, while combining of the spring sown varieties commenced on the 24th July.

Green bean trials at Thornhaugh were irrigated this year.

10.15 Coffee on Arrival
10.30 Introductory Talk by PGRO Staff
11.30 Inspection of Peas
1.00 Lunch
2.00 Inspection of Beans
3.15 Tea and Dispersal

STAFF

Director - G.P. Gent, NDA, MRAC

Agronomy & Botany

Principal Technical Officer &
Head of Section
Senior Technical Officer
Technical Officer
Technical Assistant

Ms. C.M. Knott, BSc(Hons), MIAgrE
S.J. Belcher, BSc(Hons)
J. Scrimshaw, BSc(Hons)
T.R. Duckett BSc(Hons)

Biology & Advisory Services

Principal Technical Officer &
Head of Section
Senior Technical Officer
Technical Officer

A.J. Biddle, BA, MPhil, PhD, CBiol, MIBiol
E.M. McKeown, BSc(Hons), HND (App. Biol)
Miss R.L. Ward, BSc(Hons)

Information Officer

Miss J.S. Moore, BSc(Hons)

Administration

Accounts
Administrative Officer
Administrative Officer

J.C. Boon
Mrs Z. K. Thursby
Miss S. Blake

Maintenance

J.G. Young

VINING PEAS

Summary of Variety Trial Results 1996

Varieties were evaluated in Main, Preliminary and Screening Trials. Promising varieties from 1994 and 1995 Preliminary Trials were assessed in the Main Trial. Preliminary Trial varieties are at National List stage of testing in an EU member country, while breeders material at an early stage of development is evaluated in the Screening Trial.

Seed of all varieties was treated to control damping off, downy mildew and *Ascochyta* diseases. Breeders stock of standard varieties was used in all trials. Avola replaced Sprite as the standard variety for maturity; Waverex the petits pois standard; Scout the yield standard; and Puget the late maturing standard; Bikini (semi-leafless and semi-fasciated) was also included as a standard variety.

Drilling conditions were good, but the peas were slow to emerge in the cold weather that followed. The trials established well and evenly. Broad-leaved weeds were controlled pre-emergence with Reflex T (fomesafen/terbutryn) and where required, post-emergence with Pulsar + Fortrol (bentazone/MCPB + cyanazine).

Aphid numbers built up rapidly in June and were controlled with an insecticide spray.

The harvest began on the 25th June and was completed by the 26th July.

Samples from all trials were quick-frozen, and there were few blond peas in the frozen samples this year. Samples from the Main and Preliminary trials were canned, as in previous years, without colour additive.

Main Trial, Thornhaugh - Table 1

Five varieties CO 4554, Cabree, Jaguar, Alford and Balmoral completed three years of testing in 1996 and a three year summary of results will be published in Variety Trials Manual No 1: Vining and Combining peas.

Cabree and CO 4554 matured at the same time as Avola.

Avola gave significantly higher yields than Scout. Produce was large size grade, with a good, even colour.

Cabree had shorter haulm and finer foliage than Avola. Yields were similar to Avola, but peas were smaller, medium size grade, with a good, even colour.

CO 4554 was semi-leafless and stood erect. Produce was large size grade, with a good even colour.

CMG 290 had short haulm, matured 1 day later than Avola and gave similar yields. Peas were smaller than Avola and had a bright, even colour.

Jaguar matured 5 days later than Avola and lodged severely this year. Yields were similar to Avola at TR 100, but produce was smaller, medium size grade with uneven colour.

Bikini matured 6 days later than Avola. Bikini was semi-leafless, semi-fasciated and had short haulm, but lodged badly. Yields of medium-large size grade peas were higher than Scout, but not significantly so. Pea colour was good and even.

Pascha and Waverex matured 7 days later than Avola.

Pascha was semi-leafless and stood erect. Yields of medium size grade, evenly coloured peas were higher than Scout, but not significantly so.

Waverex had very short haulm. Yields were lower than Scout, but not significantly lower. Produce was very small, with 94% of the peas <8.75mm diameter. Pea colour was rather pale and uneven.

Samish, Scout and Colana matured 8 days later than Avola.

Samish gave significantly higher yields than Scout at TR 100. Produce was medium-large size grade, with a good, dark, even colour.

Scout suffered in the dry conditions and yields were very low this year. Produce was large size grade and evenly coloured.

Colana had finer foliage than Scout. Yields were higher than Scout, but not significantly so. Produce was medium size grade and had a good bright and even colour.

Griffin matured 1 day later than Scout. Yields were higher than Scout, but not significantly so. Peas were medium-large size grade and evenly coloured.

Alford was semi-leafless, stood erect and matured 2 days later than Scout. Yields were similar to Scout. Peas were medium-large size grade and had a slightly pale colour.

Puget matured 3 days later than Scout and gave high yields, significantly higher than Scout. Peas were large-medium size grade with a pale, but even colour.

Saturn matured 4 days later than Scout. Yields were higher than Scout, but not significantly so. Peas were medium size grade with a good, bright and even colour.

Gemini, Snake and Purser matured 5 days later than Scout.

Gemini was semi-leafless and had longer haulm than Scout, but stood erect. Yields were higher than Scout, but not significantly so. Peas were medium size grade with a bright, even colour.

Snake was semi-leafless with relatively short haulm and remained erect. Yields were very high, significantly higher than Scout and the highest in the trial at TR 120. Produce was medium-large size grade, with a good even colour.

Purser was semi-leafless and remained erect. Yields of medium-large size grade peas were significantly better than Scout. Peas had a dark, even colour.

Balmoral matured 6 days later than Scout. Haulm was long, but standing ability was good. Yields were significantly higher than Scout and the highest in the trial at TR 100. Peas were medium size grade with a good even colour.

Preliminary Trial, Thornhaugh - Table 2

Twenty one varieties including the standards were evaluated.

Avola was the first variety to mature and had longer haulm than Scout this year. Yields were lower than Scout at TR 100, but similar at TR 120. Peas were large size grade with a good, even colour.

Talbot matured 2 days later than Avola. Haulm was shorter than Avola and yields were a little lower than Scout. Peas were large size grade (smaller than Avola) and had a good colour.

SIS 1494-4 was semi-leafless with short haulm. Yields were higher than Scout, but not significantly so. Peas were small-medium size grade with a good, even colour.

SIS 1481.10 and Bikini matured 7 days later than Avola.

SIS 1481.10 had short haulm and fine foliage. Produce was similar in size to Waverex with 88% of the peas <8.75mm diameter. Peas were paler than Waverex, but even in colour.

Bikini was semi-leafless, semi-fasciated and short strawed. Yields were higher than Scout, but not significantly so. Peas were medium-large size grade with a bright, even colour.

CLX 2240, Scout, Waverex, Apexina, Favorit, 4-9172 and XPF 319 matured 10 days later than Avola.

CLX 2240 gave similar yields to Scout. Produce was small-medium size grade with a good even colour.

Scout was higher yielding than in the Main Trial, but gave little increase from TR 100 to TR 120. Scout had long haulm and lodged. Peas were large size grade with a good, even colour.

Waverex gave lower yields than Scout, significantly so at TR 100. Produce was very small with 86% of the peas <8.75mm diameter. Peas were paler than Scout.

Apexina had fine foliage and gave yields similar to Scout. Produce was medium size grade, rather pale, but even in colour.

Favorit was a little higher yielding than Scout but not significantly so. Produce was medium size grade with a good even colour.

4-9172 was semi-leafless and stood erect. Yields of medium size grade, evenly coloured peas were a little lower than Scout.

XPF 319 was semi-leafless with short haulm and remained erect. Yields were similar to Waverex and produce was similar in size with 88% of the peas <8.75mm diameter. Peas had a very good, dark, even colour.

SIS 1312-2, SIS 1472-1, Costa, SIS 1276-2, Conductor, Puget and Methow matured 1 day later than Scout.

SIS 1213-2 had short haulm. Produce was large-medium size grade with a good even colour. Yields were very good, significantly higher than Scout and were the highest in the trial.

SIS 1472-1 was semi-leafless and stood erect. Yields of medium size grade, evenly coloured peas were significantly higher than Scout at TR 100.

Costa had heavy foliage. Yields of large-medium size grade peas were higher than Scout, but not significantly so. Peas had a slightly pale, uneven colour.

SIS 1276-2 was semi-leafless and stood erect. Yields of medium-large size grade peas were similar to Scout. Peas were dark and evenly coloured.

Conductor was semi-leafless, short strawed and remained erect. Yields were lower than Scout, but not significantly so. Produce was large size grade, similar to Scout and had a very dark and even colour.

Methow was higher yielding than Scout, but not significantly so. Produce was large-medium size grade with a good, dark, even colour.

CMG 297 and CMG.308 were both semi-leafless and stood erect.

CMG 297 matured 3 days later than Scout and gave significantly higher yields than Scout. Produce was medium size grade with a good, even colour.

CMG 308 matured 4 days later than Scout. Yields were similar to CMG 297, significantly higher than Scout. Produce was medium-large size grade, with a good, dark, even colour.

Promising varieties were XPF 319 (petits pois), Favorit, SIS 1213-2, SIS 1472-1, Methow, CMG 297 and CMG 308.

Screening Trial, Thornhaugh - Table 3

Thirty eight varieties including the standards were evaluated. Scout gave better yields than in the earlier sown trials, but did not give a yield increase from TR 100 to TR 120. Varieties FR 43 and FR 152 AF were selectively grazed by rabbits. Results for these varieties have therefore been omitted.

SIS 1329-5 and SIS 995.8.2 matured at the same time as Avola. SIS 1329-5 had short haulm and was lower yielding than Avola at TR 100, but gave similar yields at TR 120. Yields of all three varieties were not statistically different from Scout. SIS 1329-5 gave large size grade (but smaller than Avola) peas with even colour. SIS 995.8.2 gave peas of medium-large size grade with a dark and even colour.

FR 87 had short haulm and matured 1 day later than Avola. Yields of medium size grade peas were lower than Scout but not significantly so. FR 87 had a pale, but even colour.

Conf 164, FP 2073, FP 2067 and BL 208 matured 3 days later than Avola.

Conf 164 was semi-leafless with long haulm and stood erect. Yields were similar to Scout and produce was smaller, medium size grade. Peas had a good, dark, even colour.

FP 2073 was semi-leafless with a good erect plant habit. Yields of medium-large size grade peas were high, but not significantly higher than Scout. Peas had a good, dark, even colour.

FP 2067 was semi-leafless with short haulm and stood erect. Yields were lower than Scout, but not significantly lower. Peas were medium-large size grade with a dark colour.

BL 208 had short haulm. Yields were significantly lower than Scout, but peas were small-very small size grade with 72% of the peas <8.75mm diameter.

WAV 341, SIS 1322.3, WAV 363 and SIS 12.485.1 matured 4 days later than Avola.

WAV 341 gave high yields, but yields were not significantly higher than Scout. Produce was larger than Scout with a good, even colour.

SIS 1322.3 gave higher yields than Scout at TR 100, but not significantly higher. Produce was similar in size to Scout with even colour.

WAV 363 was significantly lower yielding than Scout. but peas were very small with 83% of the peas <8.75mm diameter. After processing pea colour was rather pale and uneven.

SIS 12.485.1 was semi-leafless and stood erect. Yields were significantly higher than Scout at TR 120 and produce size was similar. Peas had a good even colour.

FR 34, Conf 5 and Conf 163 matured 5 days later than Avola.

FR 34 had short haulm and gave significantly lower yields than Scout. Produce was very small with 81% of the peas <8.75mm diameter. Peas were dark and evenly coloured.

Conf 5 was semi-leafless and stood erect. Yields of dark, evenly coloured, medium size grade peas were significantly higher than Scout at TR 120.

Semi-leafless Conf 163 gave lower, but not significantly lower yields than Scout. Produce was medium size grade with a bright, even colour.

Bikini (semi-leafless and semi-fasciated) had very short haulm. Yields of medium-large size grade, evenly coloured peas were higher than Scout, but not significantly so.

Conf 23, Scout, Salsado, Conf 195 and FP 2083 matured 7 days later than Avola.

Conf 23 had leafy haulm like Scout. Yields of medium-small size grade peas were higher than Scout, but not significantly so. Produce had a good, dark, even colour.

Scout gave higher yields than in the Main and Preliminary trials, but gave little increase from TR 100 to TR 120. Peas were medium-large size grade and uneven in colour.

Salsado had dark, fine foliage. Yields of small size grade peas were lower than Scout, but not significantly lower. Peas had a dark, even colour.

Conf 195 gave higher, but not significantly higher yields than Scout at TR 120. Produce was medium-small size grade with a dark, even colour.

FP 2083 was semi-leafless with short erect haulm and was lower yielding than Scout. Produce was medium-small size grade with a dark, even colour.

Puget, WAV 663, 94.029, FR 100, Waverex, FP 2088, Conf 197 and SIS 1505.1 matured 1 day later than Scout.

Puget gave yields a little higher than Scout. Produce was medium size grade with uneven colour.

WAV 663 was significantly higher yielding than Scout at TR 120. Peas were medium size grade with a good colour.

94.029, FR 100 and Waverex were significantly lower yielding than Scout.

94.029 was semi-leafless and semi-fasciated and had short haulm. Produce was small-medium size grade and evenly coloured.

Produce of FR 100 was very small size grade with 83% of the peas <8.75mm diameter. Peas had a good even colour.

Waverex had short haulm and gave very small size grade produce with 91% of the peas <8.75mm diameter.

FP 2088 was semi-leafless and semi-fasciated and stood erect. Yields of medium-small size grade, evenly coloured peas were similar to Scout.

Conf 197 had longer haulm than Scout. Yields were higher than Scout, but not significantly so. Produce was medium-small size grade with a dark, even colour.

SIS 1505.1 was semi-leafless and gave similar yields to Scout. Produce was medium size grade and evenly coloured.

SIS 1561.13, Conf 231, 94.020, 94.182 and Conf 358 matured 2 days later than Scout.

SIS 1561.13 and Conf 231 (both semi-leafless) gave lower, but not significantly lower yields than Scout. SIS 1561.13 gave evenly coloured, very small size grade peas with 86% of the peas <8.75mm diameter. Produce of Conf 231 was medium size grade and a little uneven in colour.

94.020 and 94.182 were significantly lower yielding than Scout. 94.020 was conventional-leaved with a determinate, semi-fasciated habit. Produce of 94.020 and 94.182 was small-medium size grade and evenly coloured.

Produce of Conf 358 was very small, smaller than Waverex, with 95% of the peas <8.75mm diameter. Yields were significantly lower than Scout, but higher than Waverex.

FR 37 AF and SIS 1539.5 (both semi-leafless) matured 3 days later than Scout.

FR 37 AF gave evenly coloured peas of medium size grade and similar yields to Scout.

SIS 1539.5 gave significantly lower yields than Scout at TR 100, but similar yields at TR 120. Produce was medium-small size grade and evenly coloured.

Promising varieties were Conf 358 (petits pois), FP 2073, Wav 341, SIS 12.485.1, Conf 5 and WAV 663.

TABLE 1 - VINING PEA VARIETY STUDIES. Summary of agronomic data - Main Variety Trial, Thornhaugh - 1996
 Varieties placed in order of maturity. Standard varieties underlined. All varieties sown on 14th March
 Results are means of three replicates. Target population 90 plants per m² sown in ten 15 cm rows

Variety	Source	Seeds /kg	At Practical Freezing Stage										At Practical Canning Stage										Raw pea colour 1=pale 5=dark
			Maturity relative to Avola (± days)	% of shells shelled peas as % Scout	% in size grades			Maturity relative to Avola (± days)	Yield of shells shelled peas as % Scout	Haulm length cm	% in size grades	Pea wt. total	Raw pea colour	Maturity relative to Avola (± days)	% of shells shelled peas as % Scout	% in size grades			Haulm length cm	Pea wt. total	Raw pea colour		
					L	M	S									L	M	S				L	
Avola	AS	4869	0(26/6)	140†	44	43	7	0	0(28/6)	128	71	29	0	63	19	4.5							
Cabree	(XPF 291)	4550	0	138†	21	60	18	1	0	149†	36	58	5	52	20	4.5							
CO 4554	(SL) JS	4847	0	112	56	39	5	0	0	104	59	37	4	49	17	4.5							
CMG 290	CM	5168	+1	135†	34	54	11	1	+1	124	52	46	2	43	19	4.5							
Jaguar	(SIS 1469-1)	5266	+5	141†	31	59	9	1	+5	150	40	54	5	46	21	4.0							
Bikini	(SL/SF) SKG	4484	+6	116	33	53	11	1	+6	130	46	46	7	34	20	4.5							
Pascha	(XPF 274)	5283	+7	116	21	60	17	2	+7	117	25	58	15	2	20	4.5							
Waverex	VW	8264	+7	75	1	5	41	53	+7	70	47	44	8	1	21	4.5							
Samish	CM	4562	+6	137†	41	47	10	2	+8	127	47	44	8	1	21	4.5							
Scout	CM	5587	+8	100	62	32	5	1	+8	100	65	29	5	1	18	5.0							
				(3.42t/ha)						(3.74t/ha)													
Colana	Nun	5540	+8	122	18	59	21	2	+8	131	27	65	8	0	40	4.0							
Griffin	(SIS 1130.39)	5574	+9	126	43	49	7	1	+9	121	49	45	5	1	41	21	4.5						
Alfoid	(SL) BSH	7642	+10	102	32	54	13	1	+9	98	38	53	8	1	49	16	4.5						
Puget	Rto	5163	+11	145†	49	42	8	1	+10	136†	64	32	4	0	43	4.5							
Saturn	(SIS 1478.4)	6028	+12	129	18	65	16	1	+11	122	21	68	10	1	42	4.5							
Gemini	(SIS 789)	5356	+13	111	16	65	17	2	+12	108	18	65	15	2	52	19	4.5						
Snake	(CMG 298)	5379	+13	161	43	51	6	0	+12	167†	55	42	3	0	38	23	4.5						
Purser	(SL) S&G	4836	+13	134†	39	51	9	1	+12	141†	52	43	4	1	42	21	5.0						
Balmoral	(SIS 1409)	5959	+14	164†	21	63	15	1	+13	150†	23	65	12	0	52	23	4.5						

Significance @ P = 0.05
 LSD @ P = 0.05
 CV %

KEY: Yield: † Significantly greater than Scout @ P = 0.05; - Significantly less than Scout @ P = 0.05
 Size grades: L = large > 10.3mm; M = medium 8.75 - 10.3mm; 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 - Preliminary Variety Trial, Thornhaugh - 1996
 Varieties placed in order of maturity. Standard varieties underlined. All varieties sown on 4th April
 Results are means of three replicates. Target population 90 plants per m² sown in ten 15 cm rows

Variety	Source	Seeds /kg	At Practical Freezing Stage										At Practical Canning Stage										Raw pea colour 1=pale 5=dark
			Maturity relative to Avola (± days)	% of shells shelled peas as % Scout	% in size grades			Maturity relative to Avola (± days)	Yield of shells shelled peas as % Scout	Haulm length cm	% in size grades	Pea wt. total	Raw pea colour	Maturity relative to Avola (± days)	% of shells shelled peas as % Scout	% in size grades			Haulm length cm	Pea wt. total	Raw pea colour		
					L	M	S									L	M	S				L	
Avola	AS	4869	0(30/6)	81	69	27	4	0	0(3/7)	105	70	28	2	0	51	24	4.5						
Talbot	AS	4669	+2	96	57	39	4	0	+1	93	63	34	3	0	46	23	4.5						
SIS 1494-4	(SL) Sh	7003	+6	110	7	39	43	11	+6	113	7	44	41	8	30	22	4.0						
SIS 1481.10	(SL) Sh	8562	+7	159†	0	12	60	28	+6	162†	2	11	57	30	32	15	4.0						
Bikini	(SL/SF) S&G	4484	+7	106	36	51	12	1	+6	114	36	55	8	1	30	21	4.5						
CLX 2240	CI	9709	+10	95	5	40	45	10	+9	102	5	42	46	7	32	22	4.5						
Scout	CM	5587	+10	100	63	33	4	0	+9	100	70	27	3	0	42	21	5.0						
				(4.35t/ha)						(4.54t/ha)													
Waverex	VW	8264	+10	73†	1	13	50	36	+9	77	2	24	56	18	25	19	4.0						
Apexina	SQ	5556	+10	96	22	63	14	1	+9	96	24	65	10	1	39	20	4.0						
Favorit	AGIS	7027	+10	106	23	62	14	1	+9	108	23	63	12	2	44	20	4.5						
4-9172	(SL) Dan	5435	+10	94	19	56	22	3	+9	97	23	61	14	2	38	19	5.0						
YPF 319	(SL) AS	9533	+10	79†	1	11	43	39	+10	81†	2	21	57	20	27	17	4.5						
SIS 1213-2	(SL) Sh	5118	+11	144†	57	38	4	1	+10	141†	58	37	4	1	30	30	4.5						
SIS 1472-1	(SL) Sh	5650	+11	126†	20	60	18	2	+10	122	20	62	16	2	41	25	4.5						
Costa	SQ	6250	+11	111	54	42	4	0	+10	107	70	27	3	0	39	21	4.5						
SIS 1276-2	(SL) Sh	5128	+11	99	36	53	9	2	+10	99	38	49	11	2	39	18	5.0						
Conductor	(SL) S&G	4440	+11	84	64	30	5	1	+10	85	71	27	2	0	27	18	5.0						
Puget	Rto	5163	+11	114	53	41	6	0	+10	119	55	41	4	0	33	22	4.5						
Methow	CM	5747	+11	117	51	43	5	1	+10	113	53	33	3	1	37	26	4.5						
CMG 297	(SL) CM	6173	+13	130†	26	64	9	1	+11	126	30	64	5	1	43	23	5.0						
CMG 308	(SL) CM	6410	+15	127†	33	53	12	2	+13	125	33	55	11	1	44	27	4.5						

Significance @ P = 0.05
 LSD @ P = 0.05
 CV %

KEY: Yield: † Significantly greater than Scout @ P = 0.05; - Significantly less than Scout @ P = 0.05
 Size grades: L = large > 10.3mm; M = medium 8.75 - 10.3mm; 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 - Screening Variety Trial, Thornhaugh - 1996
 Varieties placed in order of maturity. Standard varieties underlined. All varieties sown on 25th April
 Results are means of two replicates. Target population 90 plants per m² sown in ten 15 cm rows

Variety	Source	Seeds /kg	At Practical Freezing Stage					At Practical Canning Stage					Haulm length as % of total weight	Raw pea colour 1=pale 5=dark			
			Maturity relative to Avola (± days)	Yield of shelled peas as % of Avola	% in size grades			Maturity relative to Avola (± days)	Yield of shelled peas as % of Avola	% in size grades							
					L	M	S			V	S	M			S	V	
SIS 1329-5	Sh	4482	0	79	55	39	5	1	0	102	58	37	4	1	35	23	4.5
SIS 995.8.2	Sh	4883	0	92	46	48	5	1	0	109	44	50	5	1	44	29	5.0
Avola	As	4669	0	107	62	33	4	1	0	127	72	25	3	0	46	24	4.5
FR 87	PLS	4505	+1	77	27	58	13	2	+2	84	33	59	7	1	38	20	3.5
Conf 164	(SL)	4872	+3	93	30	57	12	1	+2	95	34	55	10	1	48	22	5.0
FP 2073	(SL)	4987	+3	120	49	43	6	2	+3	122	50	43	6	1	38	27	4.5
FP 2067	(SL)	4529	+3	75	35	52	11	2	+3	79	45	45	8	2	34	17	5.0
BL 208	BL	7143	+3	67	4	24	40	32	+3	73	5	29	41	25	30	24	4.5
WAV 241	Pro	5086	+4	118	53	41	16	0	+4	124	60	36	4	0	39	31	4.5
SIS 1322.3	Sh	4388	+4	104	35	46	16	3	+4	113	38	48	12	2	38	30	4.5
WAV 363	Pro	9872	+4	55	2	15	52	31	+4	63	2	20	53	23	36	16	4.5
SIS 12.485.1	(SL)	5663	+4	124	28	56	15	1	+4	135	36	54	9	1	37	31	4.0
FR 34	PLS	7813	+5	59	1	18	54	27	+5	63	1	21	59	19	35	17	4.5
Conf 5	(SL)	5102	+5	106	15	49	31	5	+5	130	19	61	18	2	45	25	4.5
Conf 163	Conf	5049	+5	88	20	61	18	1	+5	90	21	64	14	1	47	21	4.5
Bikini	(SL/SF)	4484	+6	110	33	55	11	1	+6	121	31	57	11	1	31	29	5.0
Conf 23	Conf	5348	+7	117	10	49	37	4	+7	122	10	48	39	3	48	28	4.5
Scout	CM	5587	+7	100	37	51	11	1	+7	100	39	54	6	1	45	23	5.0
				(5.14%/ha)						(5.14%/ha)							
Salsado	S&G	9370	+7	80	3	26	49	22	+7	81	4	43	49	4	46	21	4.5
Conf 195	Conf	6239	+7	98	7	46	42	5	+7	120	8	52	37	3	41	26	4.5
FP 2083	(SL)	6173	+7	91	11	42	40	7	+7	90	23	40	33	4	36	23	4.5
Puget	S&G	5163	+8	106	22	57	19	2	+7	105	26	57	16	1	34	24	4.5
WAV 663	Pro	4623	+8	126	17	59	22	2	+7	127	20	61	18	1	47	27	4.5
94.029	(SF/SL)	9017	+8	54	3	32	53	12	+7	53	4	41	46	9	33	15	4.5
FR 100	PLS	8929	+8	68	1	16	56	27	+8	75	1	20	57	22	38	18	4.5
Neverex	AV	8264	+8	47	1	8	43	48	+8	54	1	10	52	24	32	15	4.0
FP 2088	S&G	5850	+8	101	10	47	38	5	+8	101	10	50	37	3	37	23	4.5
Conf 197	(SL)	6371	+8	108	8	46	39	7	+8	112	10	53	32	5	51	23	4.5

continued/...

TABLE 3 (continued) - VINING PEA VARIETY STUDIES. Summary of agronomic data - Screening Variety Trial, Thornhaugh - 1996
 Varieties placed in order of maturity. Standard varieties underlined. All varieties sown on 25th April
 Results are means of two replicates. Target population 90 plants per m² sown in ten 15 cm rows

Variety	Source	Seeds /kg	At Practical Freezing Stage					At Practical Canning Stage					Haulm length as % of total weight	Raw pea colour 1=pale 5=dark			
			Maturity relative to Avola (± days)	Yield of shelled peas as % of Avola	% in size grades			Maturity relative to Avola (± days)	Yield of shelled peas as % of Avola	% in size grades							
					L	M	S			V	S	M			S	V	
SIS 1505.1	(SL)	4005	+8	97	28	58	12	2	+8	100	34	59	6	1	49	22	5.0
SIS 1561.13	(SL)	7974	+9	84	1	13	54	32	+8	92	1	16	56	27	48	23	4.5
Conf 231	Conf	4806	+9	92	28	60	11	1	+8	96	28	60	11	1	44	22	5.0
94.020	(SF)	9930	+9	57	3	33	51	13	+8	60	4	45	48	3	38	16	5.0
94.182	VMS	7474	+9	48	3	37	49	11	+8	47	4	45	43	8	41	12	4.5
Conf 358	Conf	10318	+9	62	1	4	36	59	+9	77	2	5	43	50	47	16	4.0
FR 37 AF	(SL)	5102	+10	101	17	56	25	2	+10	102	20	61	18	1	38	21	4.5
SIS 1539.5	(SL)	5708	+10	66	8	45	39	8	+10	90	10	53	33	4	47	23	4.0
				SD						SD							
				29.1						26.0							
				16.2						13.4							

Significance @ P = 0.05
 LSD @ P = 0.05
 CV %

KEY: Yield: † Significantly greater than Scout @ P = 0.05; †† Significantly less than Scout @ P = C.05
 Size grades: L = large > 10.3mm; M = medium 8.75 - 10.3mm; S = small 7.5 - 8.75mm; VS = very small < 7.5mm
 (SL) = Semi-leafless; (SF) = Semi-fasciated
 Source of varieties see Appendix 1

Note: FR 43 & FR 152 AF were grazed by rabbits - results not available

COMBINING PEAS

Summary Of Variety Trial Results 1996

Five replicated variety trials were conducted in 1996, one of which was an overwintered trial. Some promising semi-leafless marrowfat varieties were evaluated in the Screening trial. Yields were compared with the mean of Baccara, Eiffel, Solara and Orb for the two Recommended List (RL) trials and Solara and Baccara for the Preliminary and Screening trials. Baccara was the yield standard in the coloured flowered trial and Raiale in the autumn sown trial. The human consumption quality standard was marrowfat Maro.

The Screening, Preliminary, Coloured flowered and Autumn Sown trials were carried out at Thornhaugh on a sandy loam soil. A second RL trial was conducted at Chatteris, Cambs on an organic silty loam soil. The RL trials form part of the PGRO/NIAB co-ordinated series of trials, from which the Recommended List is produced. Varieties in these trials are either fully or provisionally recommended or are candidates for the Recommended List jointly selected from the most promising registered varieties. Five varieties were in the RLO category, where extra data is sought before deciding on full Recommended List evaluation. Varieties in the Preliminary trial are at National List stage of testing in an EU member country. Breeders material at an earlier stage of development is evaluated in the Screening trial.

Seed for the trials was treated with fungicide to control damping off, *Ascochyta* and downy mildew diseases. All trials at Thornhaugh were drilled in mid-March. The peas emerged slowly, but with few losses. Broad-leaved weeds were controlled pre-emergence with Reflex T (fomesafen/terbutryn) and post-emergence with Pulsar + Fortrol (bentazone/MCPB + cyanazine). Pea growth was short and the varieties suffered in the dry conditions. Field thrips (*Thrips angusticeps*) were very active soon after emergence. Aphid (*Acyrtosiphon pisum*) and pea moth (*Cydia nigricana*) were controlled with Aphox (pirimicarb) and Hallmark (lambda-cyhalothrin). There were no infections of *Botrytis* or downy mildew. At Chatteris seedbed conditions were excellent and the peas established well. Broad-leaved weeds were controlled post-emergence with Pulsar + Fortrol. Growth was vigorous and there were marked differences in lodging between varieties. Aphid and pea moth were controlled and fungicides applied. Manganese sulphate was sprayed to prevent manganese deficiency. Some later varieties suffered an infection of powdery mildew.

In the hot, dry conditions varieties matured rapidly and were combined during the period 15th July to 19th August.

Produce quality was good. Levels of staining and numbers of "Chalky" peas (caused by *Botrytis*) were negligible. Marrowfat, small blue and large blue varieties from the Thornhaugh trials were canned using a standard process to assess quality for human consumption. Selected samples will be evaluated by a panel from the canning industry. Samples of dry produce are also being evaluated by the canning industry.

Blue seeded varieties can all be used for micronising for the pet food market, but the larger seeded marrowfats are generally preferred. Here quality is less important.

The seven new varieties to the RL trials (RLO stage) were Astina, Cossack, and Espace (semi-leafless large blue seeded), Badminton, Hibou and Bonanza (semi-leafless white seeded) and Obelisque (semi-leafless marrowfat). Candidate varieties for provisional recommendation (RL1 Stage) in 1996 were Laguna and Mickey (semi-leafless white seeded), and Lantra (semi-leafless large blue seeded).

Recommended List Trial, Thornhaugh - Table 4

The peas suffered from the dry conditions during the reproductive growth stages. Haulm was short and yields were lower than the Chatteris site.

Small blue seeded Orb matured 2 days before Solara and had excellent standing ability. Yields were lower than the control, but not significantly so. Orb gave a poor canned sample, showing excessive breakdown of the peas.

The large blue seeded varieties were all semi-leafless and had excellent standing ability. Cossack and Espace matured 1 day before Solara and haulm was a little longer. Yields of Cossack and Espace were similar to Solara. Arena, Hampton, Elan and Astina gave similar yields, a little higher than the control. Lantra matured 1 day later than Solara and gave poor yields, significantly lower than the mean of the control varieties.

None of the large blue seeded varieties gave a good sample canned peas.

All the white seeded peas were semi-leafless and standing ability of most varieties was excellent. Mickey and Alfetta matured 1 day before Solara and gave yields similar to the control. Montana, Hibou, Eiffel, Baccara, Bonanza and Chorale matured at the same time as Solara. Eiffel and Chorale had long haulm. Chorale gave the highest yields in the trial, significantly higher than the mean of the control varieties. Montana, Hibou, Eiffel, Baccara and Bonanza were all higher yielding than the control but not significantly so. Carrera, Grafila, Focus, Laguna and Badminton matured 1 day later than Solara. Grafila had long haulm, but stood well. Carrera was lower yielding than the control but not significantly so, while Focus and Grafila gave similar yields to the control. Laguna and Badminton were higher yielding than the control, but yield increases were not statistically significant.

Marrowfats Celica, Princess and Obelisque were semi-leafless. Maro, Guido and Bunting were conventional-leaved. Celica was the first to mature at the same time as Solara and had excellent standing ability. Princess and Obelisque matured 2 days later than Solara. Princess had excellent standing ability. Obelisque did not stand as well, but combining was fairly easy. Bunting and Maro matured 3 days later than Solara and Guido 4 days later. These three varieties lodged early and had less than average standing ability.

Obelisque gave the highest yields of the marrowfats, a little higher than the control. Celica gave similar yields to the control. Princess, Maro, Bunting and Guido were lower yielding than the control, the latter 2 varieties significantly so.

Obelisque gave the smallest produce and Guido the largest.

Maro, Guido and Bunting gave good samples of canned peas. Celica and Princess canned reasonably well, but not as well as Maro. Obelisque gave a poor canned sample showing excessive breakdown of the peas.

Recommended List Trial, Chatteris - Table 5

Growth at this site was more vigorous than the Thornhaugh site thus differences in standing ability were more obvious. In the hot dry conditions varieties suffered less than at the Thornhaugh site and yields much were higher.

Small blue seeded Orb was the first variety to mature. Standing ability was below average and yields were significantly lower than the mean of the control varieties.

The large blue seeded peas were all semi-leafless. Espace was the earliest to mature 2 days before Solara. Espace had longer haulm than Solara and standing ability was excellent. Lantra, Astina and Elan matured at the same time as Solara. Elan had short straw like Solara, while Lantra and Astina were longer straws, but all three stood well. Arena and Cossack matured 1 day later than Solara. Cossack had average standing ability, while Arena was longer straws and stood a little better. Lantra as at the Thornhaugh site and Arena, were significantly lower yielding than the mean of the control varieties. Espace and Solara gave similar yields to the control. Astina, Elan, Cossack, and Hampton were significantly higher yielding than the control. Hampton was the highest yielding variety in the trial.

The white seeded peas were all semi-leafless.

Alfetta matured 2 days before Solara. Haulm was short and standing ability average. Eiffel had long haulm and good standing ability and matured 1 day before Solara. Montana matured at the same time as Solara. Haulm was short and standing ability average. Carrera, Bonanza, Badminton, Mickey and Baccara matured 1 day later than Solara. Carrera, Badminton and Baccara stood well. Short straws Mickey had excellent standing ability, while the standing ability of Bonanza was average.

Grafila, Chorale, Hibou, Focus and Laguna matured 2 days later than Solara. Grafila had very long haulm and average standing ability. Chorale and Hibou were also long straws. Chorale stood well and Hibou had average standing ability. Focus had excellent standing ability and Laguna was better than average.

Grafila gave significantly low yields. Eiffel, Baccara, Focus and Laguna were significantly higher yielding than the mean of the control varieties. Alfetta, Montana, Carrera, Badminton, Mickey, Chorale and Hibou were a little higher yielding than the mean of the control varieties.

Marrowfats Celica, Princess and Obelisque were semi-leafless. Marco, Guido and Bunting were conventional-leaved. Celica matured 1 day later than Solara, followed a day later by Obelisque. Princess matured 3 days later than Solara and Guido, Marco and Bunting matured 4 days later than the standard. Obelisque had the best standing ability of the marrowfat varieties. Princess had average standing ability, but standing ability of Celica was below average at this site. Guido, Marco and Bunting had poor standing ability. Obelisque as at the Thornhaugh site was the highest yielding of the marrowfats, significantly higher than the control varieties. Celica gave similar yields to the controls. Princess, Guido, Marco and Bunting gave significantly low yields.

Produce of Obelisque was the smallest of the marrowfats, and Guido the largest. The dry seed of Obelisque was more round than drum shaped.

Preliminary Trial, Thornhaugh - Table 6

Varieties in this trial are at National List stage of testing in an EU member country. 8 varieties including the standards were evaluated. The Preliminary trial is not an official National List site, but it contains some of the varieties entered into official trials and provides a useful shop window for these varieties.

Solara, PF 819.01 and BL 746 were semi-leafless and large blue seeded. PF 819.01 matured at the same time as Solara and BL 746 matured 1 day later. All three varieties were short straws and had excellent standing ability. PF 819.01 gave the highest yields in this trial, but yields were not significantly higher than the mean of the control varieties. Solara and BL 746 were lower yielding than the control, but not significantly so.

None of the large blues gave a good canned sample, showing excessive breakdown of the peas.

Menhir, TWY 91/4 and Baccara were white seeded, semi-leafless, short straws and had excellent standing ability. TWY 91/4 and Baccara matured at the same time as Solara, while Menhir matured 1 day earlier. Yields of Menhir and Baccara were higher than the control, but not significantly so. TWY 91/4 gave lower yields than the control.

Marrowfat varieties Eagle (tare-leaved) and Maro (conventional-leaved) also had short haulm. Eagle stood well, and although Maro lodged, harvesting was not difficult. Eagle matured at the same time as Solara and Maro matured 3 days later. Maro and Eagle gave similar yields, but both were significantly lower yielding than the mean of the control varieties.

Both Maro and Eagle gave large produce and good canned samples of peas.

Screening Trial, Thornhaugh - Table 7

Thirty-six varieties including the standards and a large number of marrowfat varieties were evaluated.

Conf 730, 94.202, 94.545 and Conf 904 were small blue seeded. Conf 730 was conventional-leaved, the remainder were semi-leafless. Conf 730 and 94.202 matured 3 days before Solara, while 94.545 and Conf 904 matured 2 days before the standard. 94.545 had excellent standing ability and ease of harvest, but standing ability of Conf 730 was very poor. 94.202 stood well.

All the small blue seeded varieties were significantly lower yielding than the mean of the control varieties. Conf 904 was the highest yielding of these and Conf 730 gave particularly low yields.

None of the canned samples of small blue varieties were acceptable.

Maturing 1 day later than Solara, Conf 705 and Conf 1497 were large blue seeded and semi-leafless. Both varieties had longer haulm than Solara and all three varieties had excellent standing ability. Conf 705 and Conf 1497 gave significantly lower yields than Solara.

None of the large blue varieties gave a good sample of canned peas.

The following varieties were white seeded.

LPKE 8134/92 (semi-leafless) was the earliest of the white seeded peas to mature, 3 days before Solara. Haulm was longer than Baccara and standing ability very good. Yields were similar to Baccara.

Conf 1598 (conventional-leaved) and Conf 710 (semi-leafless) matured 2 days before Solara. Standing ability of Conf 1598 was very good and that of Conf 710 average. Both varieties were lower yielding than the control, Conf 1598 significantly so.

Semi-leafless Conf 762 had excellent standing ability, but yields were significantly lower than the mean of the control varieties.

Baccara matured at the same time as Solara and had excellent standing ability. Yields were higher than Solara, but not significantly so.

The following varieties matured 1 day later than Solara and all were semi-leafless and had excellent standing ability and ease of harvest.

LPKE 8104/92, Conf 757 and Conf 8 were significantly lower yielding than the mean of the control varieties. Conf 760 was slightly higher yielding than the mean of the controls, while LPKE 8138/92 was the highest yielding variety in this trial, but yields were not significantly higher than the control.

XAO 10 AT, LPKE 8107/92 (both semi-leafless) and Conf 753 (conventional-leaved) matured 2 days later than Solara. LPKE 8107/92 had excellent standing ability. Conf 753 had less than average standing ability, but was still easy to combine. XAO 10 AT was significantly lower yielding than the mean of the controls, while Conf 753 and LPKE 8107/92 gave similar yields to the mean of the control varieties.

The following white seeded peas matured 3 days later than Solara.

Conf 750 was semi-leafless and had excellent standing ability, but gave significantly lower yields than the mean of the control varieties. Conf 752, Conf 763, and Conf 758 were conventional-leaved and had less than average standing ability, but were still fairly easy to combine. Yields of all three varieties were similar to the control.

Eleven new marrowfat varieties were evaluated and compared to Maro. With the exception of Maro and Conf 735, all were semi-leafless.

Earliest of the marrowfats to mature was Conf 1, at the same time as Solara. Standing ability was excellent and yields were the highest of the marrowfats, similar to Solara. Conf 2 matured 2 days later than Solara. Yields were significantly lower than the control, but standing ability was good. XAP 09 BB, Conf 4, Conf 6, Conf 3, Maro, XBP 07 DY and Conf 5 matured 3 days later than Solara and gave significantly lower yields than the control. XBP 07 DY, and Conf 5 were the better yielding and had excellent standing ability. XAP 09 BB, Conf 4 and Conf 6 also stood well. Conf 3 and Maro did not stand as well, but were not too difficult to combine. Conf 735, Conf 720 and Conf 715 matured 1 day later than Maro. Yields of these three varieties were significantly lower than the control. Conventional-leaved Conf 735 had poor standing ability. Semi-leafless Conf 720 had good standing ability, while Conf 715 also semi-leafless did not stand as well.

Conf 720 and Conf 715 had very large thousand grain weight.

Many of the marrowfat varieties gave acceptable canned samples. The better varieties were Conf 715, Conf 3, Conf 6, Maro, Conf 720 and Conf 735.

Winter Pea Variety Trial, Thornhaugh - Table 8

Previous trials with overwintered peas have mainly been conducted on a confidential basis with a small number of varieties. With increased interest in autumn sowing of peas 18 varieties including standards were entered into the 1995/1996 trial. Maturity and yields were compared to the variety Rafale.

The peas remained below ground during the very cold period in late December. Plants emerged on 22/1/96 and losses were less than expected. Some effects of cold were seen in late January, but all varieties grew away from this well.

Blue seeded varieties Conf 904 and Conf 496 were semi-leafless Froidure, Conf 5 and Conf 24F were conventional-leaved. Froidure was the earliest variety to mature 2 days before Rafale and the latest was Conf 24F, 7 days later than Rafale. Conf 904 had short straw and stood very well. Standing ability of Froidure was poor and that of Conf 496 and Conf 5 a little better. Yields from Conf 904 and Conf 5 were significantly lower than Rafale. Froidure was a little lower yielding than Rafale. Yields from Conf 496 and Conf 24F were higher than Rafale, but not significantly so.

Produce of Conf 5 was very small, smaller than Froidure.

Conf 904, Froidure and Conf 5 did not can well, showing excessive breakdown of the peas.

Conf 496 and Conf 24F were not canned.

With the exception of Conf D1, Conf D2 and Conf 10F (conventional-leaved) and Victor (tare-leaved) the white seeded peas were semi-leafless.

Conf D2 was the earliest of the white seeded peas to mature, 1 day earlier than Rafale, while Conf 24F was the latest to mature 8 days later than Rafale. Rafale had excellent standing ability. Several varieties, including Conf 29F, Conf 8F, Conf 10F, and Conf 16F had shorter haulm than Rafale, but neither of them stood well. Conf D2, Victor, Conf 440 and Conf 6 also stood quite well. Elizzard had longer haulm than Rafale and standing ability was poor compared to Rafale.

Conf 16F was the highest yielding variety in this trial, significantly outyielding Rafale. Conf 440, Blizzard, and Conf 8F were a little higher yielding than Rafale, but not significantly so. Conf 6 and Conf 29F gave significantly low yields.

Conf D1 had seed with a black hilum.

TABLE 4 - COMBINING PEA VARIETY STUDIES. Summary of Agronomic Data - Recommended List Variety Trial, Thornhaugh - 1996
Standard varieties underlined. Control varieties for yield; Baccara, Eiffel, Solara & Orb
All varieties sown on 12th March. Control varieties are means of three replicates

Variety	Source	Seed 1000 grain weight (g)	Maturity days (H)Solara	Yield % of Control @ 15% MC	Straw length (cm)	Standing ability 9=erect 1=lodged	Ease of harvest 9=easy 1=difficult	1000 grain weight (g)	Water uptake %
SMALL BLUES: Target population 95 plants/m²									
Orb	(SL) Sh	210	-2	92	41	9	2	217	97
LARGE BLUES: Target population 70 plants/m²									
Cossack (90-5)	(SL) Sh	272	-1	97	41	8	9	260	94
Espace (CEB 1140)	(SL) SIL	254	-1	99	41	9	9	230	94
Arena	(SL) NIS	244	0	97	46	8	9	236	90
Solara	(SL) D	292	0 (26/7)	97	35	9	9	305	89
Hampton	(SL) Twy	274	0	103	43	9	9	302	85
Elap	(SL) SIL	314	0	103	38	9	9	284	94
Astina (CER 1141)	(SL) SIL	274	0	103	44	9	9	264	93
Lantra	(SL) SIL	263	+1	88	42	9	9	298	84
WHITES: Target population 70 plants/m²									
Mickey	(SL) DLF	311	-1	98	38	9	9	286	
Alfetta	(SL) SIL	298	-1	103	39	9	9	287	
Montana	(SL) SIL	319	0	101	43	8	9	270	
Hibou (PBINC 55-1)	(SL) PBI	236	0	104	48	7	8	247	
Eiffel	(SL) D	289	0	105	51	9	9	269	
Baccara	(SL) EL	310	0	106	50	9	9	276	
Bonanza (4-9123)	(SL) D	283	0	108	43	7	8	240	
Chorale	(SL) Sh	257	0	114+	49	8	9	228	
Carrera	(SL) SIL	260	+1	94	39	9	9	256	
Grafla	(SL) Sh	297	+1	98	53	8	9	278	
Focus	(SL) D	275	+1	100	38	9	9	277	
Laguna	(SL) SIL	248	+1	104	38	6	7	234	
Badminton (FD 992)	(SL) EL	265	+1	107	38	9	9	244	
MARROWFATS: Target population 65 plants/m²									
Ceica	(SL) SIL	323	0	98	43	9	9	326	93
Princess	(SL) Sh	326	+2	92	46	8	9	322	115
Obelisque (4-9215)	(SL) D	313	+2	103	46	5	7	278	93
Bunting	Bat	359	+3	79	42	3	5	356	108
Maro	GA	347	+3	93	43	4	6	331	108
Guido	SIL	365	+4	90	42	3	5	439	110
Mean yield of control varieties t/ha 3.55									
Significance @ P = 0.05 SD									
LSD @ P = 0.05 8.7									
CV % 6.3									

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

(SL) = semi-leafless

Source of varieties see Appendix 1

TABLE 5 - COMBINING PEA VARIETY STUDIES. Summary of Agronomic Data - Recommended List Variety Trial, Chatteris - 1996
Standard varieties underlined. Control varieties for yield; Baccara, Eiffel, Solara & Orb
All varieties sown on 28th March. Results are means of three replicates

Variety	Source	Seed 1000 grain weight (g)	Maturity days (±)Solara	Yield % of Control @ 15% MC	Straw length (cm)	Standing ability 9=erect 1=lodged	Ease of harvest 9=easy 1=difficult	1000 grain weight (g)
SMALL BLUES: Target population 95 plants/m²								
Orb	(SL) Sh	210	-4	87	42	4	6	217
LARGE BLUES: Target population 70 plants/m²								
Espace (CEB 1140)	(SL) SIL	234	-2	102	63	8	9	248
Lantra	(SL) SIL	283	0	95	66	6	8	312
Solara	(SL) D	232	0 (10/8)	99	44	7	8	306
Astina (CEB 1141)	(SL) SIL	274	0	104+	60	7	8	273
Elan	(SL) SIL	314	0	105+	50	6	8	313
Arena	(SL) NIS	244	+1	95	68	6	8	236
Cossack (90-5)	(SL) SF	272	+1	104+	54	5	7	293
Hampton	(SL) Twy	274	+2	110+	50	7	8	318
WHITES: Target population 70 plants/m²								
Alfetta	(SL) SIL	298	-2	104	47	5	7	286
Eiffel	(SL) D	288	-1	105+	66	7	8	314
Montana	(SL) SIL	319	0	103	47	5	7	302
Carreza	(SL) SIL	260	+1	101	43	7	8	279
Bonanza (4-9123)	(SL) D	283	+1	102	60	5	7	236
Badminton (FD 992)	(SL) EL	265	+1	102	48	7	8	277
Mickey	(SL) DLF	311	+1	103	43	8	9	324
Baccara	(SL) EL	310	+1	109+	54	6	7	297
Grafla	(SL) Sh	297	+2	95	84	5	7	285
Chorale	(SL) Sh	257	+2	101	66	7	8	277
Hibou (PBINC 55-1)	(SL) PRI	236	+2	103	75	5	7	251
Focus	(SL) D	273	+2	109+	56	8	9	275
Laguna	(SL) SIL	248	+2	109+	56	6	8	261
MARROWFATS: Target population 65 plants/m²								
Ceica	(SL) SIL	323	+1	99	58	4	6	335
Obelisque (4-9215)	(SL) D	313	+2	106+	53	6	8	326
Princess	(SL) Sh	326	+3	96	69	5	7	335
Guido	SIL	365	+6	87	58	2	3	366
Bunting	Bat	359	+6	90	57	2	3	357
Maro	GA	347	+6	91	64	2	3	352
Mean yield of control varieties t/ha 6.73								
Significance @ P = 0.05 SD								
LSD @ P = 0.05 3.9								
CV % 2.8								

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

(SL) = semi-leafless

Source of varieties see Appendix 1

TABLE 6 - COMBINING PEA VARIETY STUDIES. Summary of Agronomic Data - Preliminary Variety Trial, Thornhaugh - 1996
Standard varieties underlined. Control varieties for yield; Baccara & Solara

All varieties sown on 15th March. Results are means of three replicates

Variety	Source	Seed 1000 grain weight (g)	Maturity days (+)Solara	Yield % of Control @ 15% MC	Straw length (cm)	Standing ability 9=erect 1=Lodged	Ease of harvest 9=easy 1=difficult	1000 grain weight (g)	Water uptake %
LARGE BLUES: Target population 70 plants/m²									
Solara	(SL) D	292	0(26/7)	92	34	9	9	298	
PF 819.01	(SL) PBI	254	0	108	36	9	9	261	92
BL 746	(SL) PBI	265	+1	95	36	9	9	239	91
WHITES: Target population 70 plants/m²									
Menhir	(SL) PBI	253	-1	106	35	9	9	254	
TWY 91/4	(SL) TWY	260	0	93	33	9	9	265	
Baccara	(SL) EL	310	0	107	36	9	9	297	
MARROWFATS: Target population 65 plants/m²									
Eagle	(TL) PBI	345	0	85	37	8	9	334	101
Maro	GA	347	+3	88	36	9	4	335	108
Mean yield of control varieties t/ha 3.35									
Significance @ P = 0.05 8.4									
LSD @ P = 0.05 5.0									
CV %									

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

(SL) = semi-leafless; (TL) = tare-leaved

Source of varieties see Appendix 1

TABLE 7 - COMBINING PEA VARIETY STUDIES. Summary of Agronomic Data - Screening Variety Trial, Thornhaugh - 1995
Standard varieties underlined. Control varieties for yield; Baccara & Solara

All varieties sown on 18th March. Results are means of two replicates

Variety	Source	Seed 1000 grain weight (g)	Maturity days (+)Solara	Yield % of Control @ 15% MC	Straw length (cm)	Standing ability 9=erect 1=Lodged	Ease of harvest 9=easy 1=difficult	1000 grain weight (g)	Water uptake %
SMALL BLUES: Target population 95 plants/m²									
Conf 730	Conf	128	-3	75	46	1	1	131	95
94.202	(SL) VMS	117	-3	85	45	7	9	160	96
94.545	(SL) VMS	161	-2	86	46	9	9	184	97
Conf 904	(SL) Conf	196	-2	90	40	5	7	228	94
LARGE BLUES: Target population 70 plants/m²									
Solara	(SL) D	292	0(27/7)	96	43	9	9	303	
Conf 705	(SL) Conf	242	+1	86	51	8	9	249	87
Conf 1497	(SL) Conf	285	+1	86	57	9	9	310	92
WHITES: Target population 70 plants/m²									
LPKE 8134/92	(SL) Per	254	-3	106	58	8	9	272	
Conf 1598	(SL) Conf	332	-2	90	57	8	9	361	
Conf 710	(SL) Conf	265	-2	91	51	6	7	290	
Conf 762	(SL) Conf	231	-1	85	50	9	9	290	
Baccara	(SL) EL	310	0	104	43	9	9	299	
LPKE 8104/92	(SL) Per	238	+1	82	42	9	9	286	
Conf 757	(SL) Conf	238	+1	87	59	9	9	282	
Conf 8	(SL) Conf	273	+1	88	58	9	9	259	
Conf 760	(SL) Conf	273	+1	102	64	9	9	316	
LPK 8138/92	(SL) Per	280	+1	107	56	9	9	299	
XAO 10 AT	(SL) JS	233	+2	90	48	7	8	289	
Conf 753	(SL) Conf	235	+2	96	59	5	7	279	
LPKE 8107/92	(SL) Per	314	+2	100	51	9	9	327	
Conf 750	(SL) Conf	217	+3	86	52	8	9	221	
Conf 752	(SL) Conf	225	+3	101	63	5	7	284	
Conf 763	(SL) Conf	191	+3	101	53	6	8	261	
Conf 758	(SL) Conf	271	+3	102	52	4	6	295	

continued/....

TABLE 7 (continued) - COMBINING PEA VARIETY STUDIES. Summary of Agronomic Data - Screening Variety Trial, Thornhaugh - 1995
Standard varieties underlined. Control varieties for yield; Baccara & Solara
All varieties sown on 18th March. Results are means of two replicates

Variety	Source	Seed 1000 grain weight (g)	Maturity days (±)Solara	Yield % of Control @ 15% MC	Straw length (cm)	Standing ability 9=erect 1=lodged	Ease of harvest 9=easy 1=difficult	1000 grain weight (g)	Water uptake %
MARROWFATS: Target population 65 plants/m²									
Conf 1	(SL) Conf	319	0	95	48	9	9	320	100
Conf 2	(SL) Conf	396	+2	81-	46	8	9	367	108
XAP 09 BB	(SL) JS	295	+3	76-	56	7	8	336	104
Conf 4	(SL) Conf	418	+3	80-	47	8	9	397	107
Conf 6	(SL) Conf	390	+3	81-	49	7	8	355	110
Conf 3	(SL) Conf	416	+3	83-	54	4	6	383	114
Maro	GA	347	+3	88-	47	3	5	338	112
XBP 07 DY	(SL) JS	259	+3	90-	51	9	9	329	102
Conf 5	(SL) Conf	399	+3	90-	48	9	9	373	113
Conf 735	(SL) Conf	349	+4	64-	38	1	2	369	108
Conf 720	(SL) Conf	348	+4	74-	45	7	8	419	110
Conf 715	(SL) Conf	360	+4	77-	40	4	6	401	108

Mean yield of control varieties t/ha
Significance @ P = 0.05
LSD @ P = 0.05
CV %

KEY: Yield: + Significantly greater than control @ P = 0.05; - Significantly less than control @ P = 0.05
(SL) = semi-leafless;
Source of varieties see Appendix 1

TABLE 8 - COMBINING PEA VARIETY STUDIES. Summary of Agronomic Data - Winter Pea Variety Trial, Thornhaugh - 1995/1996
Standard varieties underlined. Control variety for yield; Rafale
All varieties sown on 20th November. Results are means of three replicates

Variety	Source	Seed 1000 grain weight (g)	Final Plant Population (±) Rafale	Maturity days	Yield % of Control @ 15% MC	Straw length (cm)	Standing ability 9=erect 1=lodged	Ease of harvest 9=easy 1=difficult	1000 grain weight (g)	Water uptake %
BLUES: Target population 70 plants/m²										
Conf 904	(SL) Conf	250	74	-1	89 ⁻	41	8	9	282	94
Froisourc	HAM	166	79	-2	95	55	1	3	186	96
Conf 496	(SL) Conf	172	69	+1	106	61	3	5	212	95
Conf 5	Conf	90	77	+5	79 ⁻	67	3	5	126	103
Conf 24F	Conf	140	69	+7	103	73	2	4	197	
WHITES: Target population 70 plants/m²										
Conf D2	(SL) Wh	159	70	-1	94	48	7	8	210	
Rafale	Wh	170	72	0(19/71)	100	56	9	9	192	
Conf D1	Conf	199	73	+1	103	54	6	8	249	
Conf 437	(SL) Conf	174	69	+2	98	57	4	6	202	
Victor	(TL) PH	222	71	+4	98	45	7	8	238	
Conf 440	(SL) Conf	190	68	+4	104	59	7	8	187	
Conf 6	(SL) Conf	200	73	+5	89 ⁻	57	6	8	254	
Conf 17F	(SL) Conf	207	65	+5	93	44	2	4	200	
Blizzard	(SL) Wh	194	69	+5	103	62	3	5	243	
Conf 29F	(SL) Conf	110	66	+5	89 ⁻	57	2	4	221	
Conf 8F	(SL) Conf	157	75	+6	104	39	3	5	200	
Conf 10F	(SL) Conf	162	64	+7	93	58	2	4	206	
Conf 16F	(SL) Conf	156	80	+8	111 ⁺	40	2	4	198	

Mean yield of control variety t/ha
Significance @ P = 0.05
LSD @ P = 0.05
CV %

KEY: Yield: + Significantly greater than control @ P = 0.05; - Significantly less than control @ P = 0.05
(SL) = semi-leafless; (TL) = tare-leaved
Source of varieties see Appendix 1

GREEN BEANS

Summary of Variety Trial Results 1996

Main and Preliminary Trials are partly funded by the Horticultural Development Council (HDC). Main Trial varieties included four very fine/extra fine podded beans, a fine Nerina type and a large long podded variety. There were several very fine/extra fine beans in Preliminary Trial, a reflection of the market in France, and the remainder were long podded, suitable for cutting or slicing. Yield and maturity are related to Nerina the standard. Laguna is now included as the intermediate length/medium width bean, replacing Groffy which is now only included as a harvesting standard.

All seed was treated with an insecticidal/fungicidal seed treatment to control bean seed fly (*Delia platura*) and fungal 'damping off' disease. The Main Trial was sown on 23 May into a moist seedbed and emerged quickly during a spell of warm weather. The Preliminary Trial was sown on 6 June just before rain on the 7th. Seedbed conditions were good for both trials. Rainfall during June and July was much lower than the long-term average and the trials were irrigated on one occasion. Temperatures were not as high as in the previous year. There was 19 mm of rain 10-11 August just before the start of harvest of the Preliminary Trial.

Harvesting began on 5 August, and the beans matured slowly in comparison with the previous year so relative maturity differences between varieties were greater.

All varieties were machine harvested with a Ploeger transverse 3 row plot harvester, and data for percentage of 'T' stalks in the samples are presented in Table 11. The figures were generally lower than in 1995.

Main Trial varieties and a large number of new ones (40 in total) from several seed companies were demonstrated at a site near Aylsham, Norfolk on 29 August - the wettest day of the summer.

Main Trial, Thornhaugh - Table 9

Evaluation of Mondeo and Sonore was extended but the varieties Nickel and Scuba are in their last year of evaluation.

Four very fine/extra fine podded beans were compared with Masai the standard for this group.

Masai, a very fine bean, had uniform short straight pods. Colour and maturity was uneven in this trial and the processed sample was better for the Preliminary Trial.

Sonore, had very fine, long pods which were not as straight or dark as Masai. It gave an attractive quick-frozen sample. Pod distribution on the plant was rather tangled.

Rasada, had a narrower pod width than Masai, pods were dark and maturity was uneven. It was the lowest yielding in this group. Plants were tall and erect, pod distribution was good and there was a very low percentage of 'T' stalks in the harvested produce as in 1995.

Piccolo (Bk5), an extra-fine bean, the finest in this group gave an attractive, but very dark frozen sample with straight, even pods. Raw bean colour was medium. Seed development was slow.

Nickel, a very fine podded variety was high yielding in this trial. Beans were straight and uniform size. Seed development was slow. Pods were rather tangled on the plant.

There were only two short podded fine varieties in trial:

Lasso, the standard variety suffered from drought stress; plants were short, some pods touched the soil and maturity was very uneven and yields low. Pod colour was medium/pale.

Mondeo, was wider podded than Lasso, more suitable for cutting (or slicing). Pods were even size and good medium dark colour. The quick-frozen sample had a good flavour. Yields and harvestability were good.

One variety was compared with Nerina, both were suitable for cutting:

Faulista, was much slimmer than Nerina. Pods were dark, very straight. Yields were better at canning stage, (the first at quick-freezing stage was harvested too early). A few touched the soil.

Nerina, pods were rather curly and maturity and pod size was uneven.

Paulista and Nerina had a high percentage of 'T' stalks in the sample.

Two varieties with medium pod width and intermediate length were compared with Laguna the standard:-

Scuba, was early maturing and lower yielding than Laguna. Pods were uneven in maturity. Plants were not as tall as Laguna and pods were set low and some had touched the soil. There was a high number of 'T' stalks in the machine harvested sample.

Nomad, was high yielding and pods were medium/dark and straight and slimmer than Laguna. Harvesting early avoided development of large seeds. The percentage of 'T' stalks in the machine harvested sample was average, similar to Laguna.

Laguna, the standard, performed very well: yields were high, pods were even, straight and dark and seed development was slow.

There was only one large bean suitable for cutting or slicing in trial:-

Matador, yields were similar to Laguna and pods were wide. Although plants were leafy and tall, the pods were set very low, several touched the soil and were rather curly. It had the lowest percentage of 'T' stalks in trial.

Preliminary Trial, Thornhaugh - Table 10

Varieties entered for Preliminary Trial are on, or entered for, National List in an EU member country.

Six very fine/extra-fine varieties were compared with Masai, which yielded well in this trial. Sapporo and Primera were also high yielding in this group. Sifin, CO6827, BL90-BL5 and BL87-D55 all suffered from split flowering thus maturity was uneven and all were lower yielding than Masai. Masai and Primera had the lowest percentage of 'T' stalks in the machine harvested sample; BL87 D55 and Sapporo had the highest.

CO6827, was early maturing, pods were a little larger than Masai and nearly as straight. Several pods touched the soil.

Masai, yielded better than in the Main Trial and the quick-frozen sample was more even.

Primera, a finer podded bean than Masai performed well. Pods were straight, uniform and a dark green colour.

Sifin, had extra fine beans. It appeared to be sensitive to drought stress: Plants were short, several pods touched the soil and were not as straight as Masai.

BL90-BL5, another extra fine bean, longer than Masai, gave an attractive quick-frozen sample of produce with a good colour. Plant habit was good, better than Sifin.

BL87-D55, a very fine, long podded bean, was early maturing but uneven. Pods were medium/pale. Plants were tall, leafy and rather lax.

Sapporo, a very fine long podded type had glossy medium/dark pods that became paler after processing. It was later maturing than Masai, not as uniform and pods covered a range of size grades.

In Preliminary trial no varieties were compared with Lasso which performed better than in Main Trial, Nerina, or Laguna. Laguna gave very high yields of straight, uniform dark pods. All other varieties evaluated were long podded and with medium-large pod width.

RS1384, was very early maturing, but suffered from split flowering and uneven maturity. Pods were a similar width and colour to Nerina but longer.

CO6739, also matured early, but suffered from split flowering and uneven maturity. Pods had a dull rough skin, pod colour became darker after processing. The beans were tall and vigorous but pods were set low on the plant and were rather curly.

Marcio, was outstanding in this trial and at Aylsham. Yields were good. Pods were glossy, medium/dark green and held their colour and maturity well. Seeds were small. Pods were exceptionally straight (unusual for a long podded variety), and slimmer than Laguna. The beans were tall, leafy and vigorous, but had a slightly lax plant habit. It had the higher percentage of 'T' stalks in this group.

HS5620(Classic), was the darkest podded bean in trial, and size was uniform. It was the lowest yielding in this group, but gave a good quick-frozen product.

NUN 3494, was the highest yielding variety in trial. Pods were also the largest and were very straight for a long podded type and particularly even. They were also rather pale and the quick-frozen product was less attractive than Laguna. Plants were tall and vigorous and pods well spaced on the plant.

HS 6694(Tasman), pods were longer and wider and not as dark as HS 6620. Maturity and size was uneven. The beans were more leafy than HS 6620 and some pods touched the soil. However, harvesting characteristics were otherwise good with the lowest percentage of 'T' stalks in this trial.

The most promising varieties were Marcio, Primera and possibly NUN 3494.

TABLE 9 - GREEN BEAN VARIETY STUDIES. Summary of agronomic data - Main Variety Trial 1996. Varieties placed in order of maturity within each group. Standard varieties underlined. All varieties sown on 23 May. Results are means of three replications. Target populations 49 plants per m². Row width 25 cm

Variety	Source	Seeds /kg	At Practical		Yield % of Nerina	Maturity relative to Nerina	Yield % of Nerina	No. pods touching soil	External colour raw	Pod Characteristics						
			Freezing Stage							Canning Stage		Shape 1=v, curved 5=straight	Average length cm		Section	
			Maturity (± days)	relative to Nerina						Maturity (± days)	relative to Nerina		F	C	F	C
<u>Very fine/extra fine</u>																
Masai	S&G	5747	- 2	66	- 3	55	5	M/D	4.9	5.0	9.5	9.7	4.0	4.2	7.1	7.4
Sonore	PV	6423	- 1	70	- 2	74	5	M	4.7	4.7	11.8	12.0	3.5	3.9	7.1	7.4
Rasada	Nun	7680	0	62	- 1	62	5	M/D	4.7	4.6	11.1	11.1	3.7	4.0	7.0	7.1
Piccolo	Sh	7937	+ 2	64	+ 1	73	5	M	4.7	4.8	11.2	11.5	3.8	4.5	6.3	6.8
Nickel	Nis	4935	+ 3	99	+ 2	93	5	M/D	5.0	4.5	10.9	11.1	4.0	4.4	7.1	7.4
<u>Fine (Short)</u>																
Lasso	PV	7076	- 2	71	- 3	72	5	M/P	4.7	4.8	9.2	9.6	4.0	4.8	7.9	8.3
Mondao	PV	5052	0	86	0	94	5	M/D	4.9	4.9	9.7	9.8	4.8	5.0	8.8	9.3
<u>Fine (Intermediate)</u>																
Nerina	RS	4965	0	100	0	100	5	M/D	4.5	4.3	11.5	12.1	4.0	4.8	8.8	9.1
Paulista	RS	4973	0	74	- 1	100	5	D	4.9	4.9	11.9	12.2	4.8	5.0	8.1	8.4
<u>Medium (Intermediate)</u>																
Scuba	PV	4200	- 2	89.6	- 3	90	5	M/D	4.9	4.9	11.5	11.7	4.6	4.9	9.4	9.9
Nomad	PV	3858	+ 2	120	+ 2	124	5	M/D	5.0	5.0	11.8	12.2	4.7	4.9	8.9	9.3
Laguna	PV	3407	+ 1	126	+ 2	140	5	D	5.0	5.0	11.8	12.0	4.9	5.0	9.4	9.6
<u>Large (Long)</u>																
Macador	As	3916	+ 2	135	+ 2	130	5	D	3.7	3.9	13.1	13.7	4.9	5.0	10.0	10.2
Significance @ P = 0.05																
LSD @ P = 0.05																
CV%																
SD																
0.36																
0.24																
1.9																
1.3																
1.6																
1.1																

Key: Significantly lower yield than Nerina @ P = 0.05; + Significantly higher yield than Nerina @ P = 0.05.
 # Plant habit 5 = vigorous/erect; 1 = short/lax. Colour M = medium, D = dark, P = pale
 Fine (Short) pods (10 cm length or less) suitable for freezing or canning whole; freezing stage SL 100-110
 Very fine/extra-fine pods (10 - 13 cm length; 6.5 - 8 mm width). Maturity judged by pod width.
 Fine (Intermediate); pods (10 - 13 cm length; 8-9.5 mm width) suitable for freezing whole or cutting; freezing stage SL 80-96; canning SL 100-110
 Medium (Intermediate) pods (10 - 13 cm length; > 9.5 mm width) suitable for cutting (or slicing); freezing stage SL 90; canning SL 110
 Medium (long) pods (> 13 cm length; < 9.5 mm width) suitable for cutting; freezing stage SL 90; canning SL 110
 Large (long) pods (> 13 cm length; > 9.5 mm width) suitable for cutting or slicing; freezing stage SL 100; canning SL 120

Source of varieties see Appendix 1

BROAD BEAN VARIETY TRIAL

This trial, in its second year, is funded by the Horticultural Development Council (HDC). Although several varieties have been entered in the trial system over the years they seldom complete three years tests and the newer varieties have not been compared with an established range. Yield and maturity data for a range of varieties will be used to produce a growers leaflet on broad bean varieties.

Broad Bean Trial, Thornhaugh - Table 12

Four standard sized broad beans including a coloured flowered variety were compared with Medes the yield and maturity standard. Scorpion, tested in 1995, has been withdrawn from the market by the breeder. The trial also included four small and one very small and three bright green, seeded beans. Three additional varieties were at screening stage.

Seed of all varieties was treated with fungicide to control "damping off" disease and sown on 10 April so that they followed vining peas in the harvesting sequence, as required in commercial practice.

The trial was sown in ideal seedbed conditions on a sandy loam soil with good tilth. Broad-leaved weeds were controlled with Reflex T (fomesafen/terbutryn) pre-emergence and cleavers with Basagran (bentazone) post-emergence. Aphox (pirimicarb) was applied to control bean aphid (although none were seen), and Folio (metalaxyl/chlorothalonil) fungicide to control a slight infection with downy mildew (*Peronospora viciae*). Most varieties were infected with bean rust (*Uromyces fabae*), with Talia, Beryl and Statissa and Jade suffering the worst infection, Metissa the lowest. There is no fungicide registered to control this disease in broad beans.

Diamant was the earliest variety to mature (18 July), followed by Metissa (19 July). Beryl (1 September) and Jade (31 August) were the latest.

Samples were quick-frozen at about 130 TR (for 140g sample) and canned at about 120 TR (for a 56g. sample).

Large Seeded:-

Medes, tall vigorous variety and the control standard for yield, yielded well, better than in the 1995 trial.

Listra outyielded Medes and all other varieties in trial (although the differences between Metissa or Statissa were not statistically significant). It matured one day after Medes.

Metissa also outyielded Medes and was the earliest maturing variety in this group. It was the shortest strawed variety and appeared more susceptible to downy mildew than other varieties.

Statissa, a coloured flowered variety unsuitable for canning, performed better than in 1995, yields were significantly higher than Medes. Bean seed size was very large this year.

Optica, slightly smaller seeded than Medes, out yielded similarly.

Small Seeded:-

There were five small seeded varieties in trial and of these Danko and Gold (NIZ90-196) were the largest of the group. Gold yielded higher than Danko at quick-freezing stage and lower at canning stage. Danko beans are rather rounded, Gold has very uniform sized produce.

Diamant and Talia yielded similarly with high yields for a bean of this type. Talia beans were slightly smaller than Diamant. Produce from both varieties was a uniform size.

Beryl, tall and late maturing, was the smallest seeded variety in trial and yields, as in 1995, were correspondingly low.

There were three green seeded broad beans in trial:

Jade a late maturing variety gave poor yields of small seeded bright lime green beans.

Greeny very tall and also late maturing, gave better yield of beans than Jade and beans were a similar size and colour.

Verdy was the highest yielding variety in this group and produce with a strong green colour, even size and good flavour was the most attractive and could be useful as an interesting new product.

Screening Trial

6-9038 appeared to suffer from bean leaf roll virus and yields were significantly lower than Medes. The bean seed size was similar to Medes.

6-9022 was a very tall vigorous variety which set many pods, but maturity was uneven. Seed size was small and not very uniform.

6-9037 was the highest yielding of the three, similar to Medes. Beans were slightly smaller than Medes.

TABLE 12 - BROAD BEAN VARIETY STUDIES. Summary of agronomic data - Variety Trial, Thornhaugh - 1996. Varieties placed in order of maturity within each group. Standard varieties underlined. All varieties sown on 10th April. Results are means of three replicates. Target population is plants per m². Row width 30 cm.

Variety	Source /kg	Seeds (t Days)	At Practical Freezing Stage			At Practical Canning Stage			Plant height cm
			Maturity relative to Medes	Yield as % of Medes	Mean length 10 beans mm	Maturity relative to Medes	Yield as % of Medes	Mean length 10 beans mm	
Metissa	NLS	1019	- 3	120*	205	- 2	123	215	63
Optica	NLS	1052	- 2	101	191	- 2	95	196	71
Statissa (C)	NLS	811	- 1	118*	212	- 1	117	219	77
Medes	NLS	1181	0	100	199	0	100	203	88
			(22/1)	(8.8 t/ha)		(26/1)	(9.3 t/ha)		
Lustre	Nun	1351	+ 1	131*	200	+ 1	127	206	81
<u>Smaller seeded</u>									
Diamant	NLS	1326	- 4	91	171	- 3	87*	175	69
Gold (NIZ90-196)	NLS	1809	- 1	82	177	- 1	93	179	74
Danko	Nun	1800	- 1	89	178	0	86*	181	70
Talia	Nun	1675	+ 1	96	167	+ 1	77*	171	67
<u>Very small</u>									
Beryl	S&G	2309	+ 10	56*	160	+ 10	58*	165	83
<u>Green seeded</u>									
Verdy	Nun	1511	+ 3	94	176	+ 3	87*	183	74
Greeny	Nun	1756	+ 7	80*	172	+ 7	83	175	99
Jade	NLS	1530	+ 9	60*	175	+ 9	56*	178	82
<u>Screening Trial</u>									
6-9038	Pro-Veg	1575	0	81*	198	0	84*	205	68
6-9022	Pro-Veg	1746	0	83*	172	0	79*	174	93
6-9037	Pro-Veg	1708	+ 1	96	185	0	101	190	88
Significance @ P = 0.05				SD	SD		SD	SD	SD
LSD @ P = 0.05				15.4	3.8		12.7	2.9	6.25
CV%				10.0	1.2		8.4	0.9	4.8

Key: C= coloured flowered; - Significantly lower yields than Medes @ P = 0.05; + Significantly higher yield than Medes
 Practical freezing stage: TR 110 - 140 for a 140g sample
 Practical canning stage: TR 115 - 140 for a 56g sample

PROCESSING DETAILS FOR CANNED 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 and further sorting the cans were filled, the brine added and then the cans were sealed and processed. After processing the cans were cooled in chlorinated water and air dried ready for storage.

The processing details for each group are given below:-

- Vining Peas
 Blanch: 1.5 min. @ 93°C
 Wt/280 g can 194.5 g
 Brine: Sugar 15 g/l of water @ 93°C
 Salt 13 g/l of water @ 93°C
 Process: 15 min. @ 121°C, 1.05 kg/cm² pressure
- Green Beans
 Blanch: 6 min. @ 74°C
 Wt/280 g can 142 g
 Brine: Salt 15.6 g/l of water @ 93°C
 Process: 15 min. @ 121°C, 1.05 kg/cm² pressure
- Broad Beans
 Blanch: 4 min. @ 85°C
 Wt/280 g can 194.5 g
 Brine: Salt 18.83 g/l of water @ 93°C
 Process: 14 min. @ 121°C, 1.05 kg/cm² pressure
- Combining Peas

The percentage of non-soakers (peas which did not take up water during the following soaking process) were estimated.

- Soak: 18-24 hours in water of 6°C hardness
 Blanch: 2 min. @ 84°C
 Wt/280 g can 125 g
 Brine: Sugar 15 g/l of water @ 82.5°C
 Salt 14.5 g/l of water @ 82.5°C
 (*Colour 0.18 g of U.R. 213/l of water @ 82.5°C)
 (*Mint 0.11 ml/l of water @ 85.8°C)
 Process: 20 min. @ 121°C, 1.05 kg/cm² pressure

* This year samples were processed without colour or mint.

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 each crop are given below:-

1. Vining Peas

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

2. Green Beans

Blanch: 4 min. @ 85°C whole
 Cut or packed whole according to process requirement
 Blast frozen @ -30°C
 Stored @ -18°C

3. Broad Beans

Blanch 4 min. @ 82°C
 Blast frozen @ -30°C
 Stored @ -18°C

APPENDIX 1

KEY TO SOURCE OF VARIETIES

AGIS	AGIS, Germany
As	Asgrow Seed Company, USA
Bat	Van den Bergh Foods Limited, UK
Bl	André Blondeau Semences, France
Bro	W. Brotherton Seed Company Inc., USA
BSH	British Seed Houses, UK
Cl	Clause S.A., France
CM	Crites-Moscow Growers Inc., USA
Conf	Confidential
D	Dalgety Agriculture Limited, UK
Dan	Danisco Seed A/S, Denmark
DLF	DLF Trifolium, Denmark
El	Elsoms Seeds Limited, UK
GA	General Availability
HAM	Harlow Agricultural Merchants, UK
HS	Holland Select BV., Holland
JS	Johnsons Seeds Limited, UK
NiS	Nickerson Seeds Limited, UK
Nun	Nunhems Zaden BV., Holland
PBI	Plant Breeding International, Cambridge, UK
Per	Perryfields Seeds, UK
PH	Pioneer Hi-bred, UK
PV	Pop Vriend BV., Holland
Pro-Veg	Pro-Veg Seeds
PLS	Pure Line Seeds Inc., USA
RS	Royal Sluis Limited, UK
S&G	S & G Semences, France
Sh	Sharpes International Seeds Limited, UK
SIL	Seed Innovations Limited, UK
SQ	Saatzuch Quedlinburg, Germany
Twy	CPB-Twyford, UK
vMS	van Mierlo Seeds, Holland
vW	van Waveren, Germany
WAC	W. A. Church (Bures) Ltd, UK
Wh	Wherry & Son Limited, UK

NOTES

NOTES

NOTES

