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1/1988

PROCESSORS & GROWERS RESEARCH ORGANISATION

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THE SEASON

During the first two weeks in May and the first three weeks in June, rainfall was high and temperatures were often below average. Some commercial crops of green beans suffered from poor emergence and vigour as a result of heavy rain soon after sowing. The latter parts of May and June were drier. A warm humid spell at the end of June induced an attack of downy mildew (*Peronospora viciae*) in some broad beans. The wet weather persisted in July and the amount of rainfall was more than twice the long term average. July was also cooler than average and there was little sunshine. The latter part of August was warmer. September was a dry month and green bean crops were less affected by *Botrytis* than in 1987.

Harvest of navy bean varieties was very late beginning on 6th October and the last variety matured twenty seven days later.

Meteorological Data - Thornhaugh

Month	1988 Average Temperature °C		Long-term Average Temperature °C	
	Maximum	Minimum	Maximum	Minimum
May	16.9	6.5	15.7	6.5
June	20.5	9.7	19.1	9.5
July	19.9	10.9	20.6	11.1
August	21.6	10.5	20.4	11.4
September	18.8	9.3	18.1	9.7
October	14.8	6.7	14.1	7.2

Month	1988 Monthly Rainfall mm	Long-term Average Rainfall mm
May	56.7	46.2
June	48.7	49.7
July	101.5	52.5
August	42.9	63.5
September	26.9	46.2
October	51.7	44.6

Source of local Meteorological Data: Marholm, Peterborough.

4/1988

S U M M A R Y

G R E E N B E A N S

M A I N T R I A L V A R I E T I E S T E S T E D 1 9 8 5 - 8 8

In 1987 establishment of the Main trial was poor because of adverse seedbed conditions after sowing and evaluation of the varieties was repeated in 1988.

Green beans did not perform well in the cool wet season of 1985. In contrast the weather in 1986 was hotter and drier than average in June and July but during the harvest period temperatures were lower and rainfall higher than average. In 1988 performance of most varieties was very good.

The larger seeded varieties appeared more cold tolerant than the small seeded, short podded types.

Of the short podded varieties, Lasso was outstanding. The variety has a vigorous, erect, plant habit, yields were good and pods an even size, similar to Gitana. Odessa (025), an early maturing variety, had neat pods which were slimmer than Gitana the standard. Mirel and Laureat yielded similarly to Gitana. Pods of Mirel were not as straight as the standard and were rather uneven in the 1988 trial.

Celero, an early maturing variety, was lower yielding than Nerina, but pods were straighter and slimmer. It had an erect plant habit with good harvesting characteristics. Sentry on the other hand gave similar yields to Nerina and pods were of similar width but straighter. The plants were not as erect as Nerina.

Burly, a very vigorous cold tolerant leafy variety had long, wide fleshy pods which are ideal for slicing and yields were good during two years of trial.

GREEN BEAN VARIETY STUDIES

Summary of Agronomic Data - Main Variety Trial 1985 - 88.

Varieties placed in order of maturity within each group. Standard varieties underlined. All varieties sown on Results are means of three replicates. Target population plants/m². Row width 30 cm.

Variety	Source	Seeds /kg	At Practical Freezing Stage		At Practical Canning Stage		Plant habit 1=lax 5=erect	No. of pods touching soil 1=most 5=none	External colour	Shape 1=very curved 5=straight	Pod Characteristics		
			Maturity (+ days) relative to Groffy	Yield as % of Groffy	Maturity (+ days) relative to Groffy	Yield as % of Groffy					Average length cm	Section 1=flat 5=round	Pod width mm
Short Podded													
(2) Odessa	HS	5329	-2	80 ⁻	-1	81 ⁻	4	3	M	4.7	10.0	4.6	8.3
(3) Lasso	PV	5778	0	88	0	98	5	4	M	4.6	10.2	4.6	8.6
(2) Laureat	As	5879	+1	73 ⁻	0	81 ⁻	5	4	M	4.6	10.2	4.5	8.5
(2) Mirel	PV	5488	+1	74 ⁻	+1	86	5	4	M/D	4.4	10.5	4.5	8.5
<u>Gitana</u>	RS	5794	+3	80 ⁻	+3	88 ⁻	4	3	M/D	4.5	10.2	4.6	8.5
Intermediate Podded Whole													
(3) Celero	Ni	6832	-5	73 ⁻	-5	79 ⁻	5	5	M	4.7	11.9	4.6	8.6
Nerina	RS	4515	0	84	+1	97	5	5	M/D	4.6	12.8	4.7	9.5
(2) Sentry	As	5373	+3	87	+3	96	3	4	M/P	4.7	12.4	4.5	9.3
Intermediate Podded													
<u>Groffy</u>	Nun	3288	0	100	0	100	5	5	P/M	4.8	12.9	4.8	11.4
(18.4 t/ha)													
Long Podded													
Cascade	Bk	2771	+2	99	+2	110	4	3	M	3.8	16.4	4.9	12.6
(2) <u>Burly</u>	Rog	2429	+3	100	+3	102	3	3	M	3.9	15.4	5.0	13.0

- Significantly lower yielding than Groffy. () No. years in trial.

Key: P = Pale, M = Medium, D = Dark.

Short pods (10 cm or less) suitable for freezing or canning whole; freezing stage SL 80; canning SL 90.

Intermediate pods (10 - 13 cm length; less than 9.5 mm width) for freezing whole or cutting; freezing stage SL 90; canning SL 110

Intermediate pods (10 - 13 cm length) suitable for cutting (or slicing); freezing stage SL 90; canning SL 110

Long pods (more than 13 cm length) suitable for cutting or slicing; freezing stage SL 100; canning SL 120.

T R I A L S I N I 9 8 8

Thirty-three new varieties were evaluated in PGRO trials this season. They included a large number of varieties for freezing whole, and a few very fine beans. Whilst several of these are marketed on the continent, they may be less suitable for cooler UK conditions. Commercial crops of whole beans were successfully grown in the UK last season however. Few long-podded beans for cutting or slicing were entered. Standard varieties are Gitana, short-podded for quick-freezing or canning whole, Nerina slim intermediate for freezing whole, Groffy of intermediate length with wider pods suitable for cutting or slicing and Cascade long-podded for cutting or slicing. In all trials yields and maturity are relative to Groffy.

All seed was treated with an insecticidal/fungicidal seed treatment to control bean seed fly (Delia platura) and fungal diseases. The Main Trial was sown first on 16th May, followed by the Preliminary Trial on 23rd May and the Screening Trial on 8th June. Emergence was very good and frequent rainfall produced vigorous plant growth. Yields of even the short-podded types were very acceptable this year. Produce from the earlier sown trial appeared paler than usual and may have been affected by leafy growth and lack of sunshine. With the exception of one or two varieties there was little wind scar on pods, and Botrytis was not a problem.

M A I N T R I A L - I 9 8 8

Evaluation of some Main Trial varieties was continued for an additional year since emergence was poor under cold, wet conditions in 1987, and a total of eleven varieties were tested, including the standards.

The short-podded varieties all performed very well this season in terms of yields and quality. Lasso, a vigorous variety with an erect plant habit, was outstanding in this group, and gave high yields and a good even processed sample of produce. Odessa, the earliest in this group, had shorter plants and pods were a little neater and slimmer than the other varieties. Mirel was uneven in size and maturity, pods tended to be more curved than the other short-podded varieties. As in previous trials, the seed development in pods of Laureat was rapid and yields were lower than Gitana, but differences were not statistically significant.

Celero was the earliest maturing variety in the trial. It has a good plant habit (although it was indeterminate at Aylsham) exhibiting good harvesting characteristics in other trials, but yields were disappointing. Pods of Celero were paler than Nerina, but straighter and slimmer than the other varieties, and well within the width specification of 9 or 9.5 mm. Nerina the standard for this group again performed well, plant habit was good, but pods tended to be distributed in a central cluster. Sentry the latest maturing variety in this group yielded well. Pod colour was slightly paler than Nerina but straighter and of similar size.

6/1988

Groffy the standard intermediate podded variety, the only one of its class, compared well with cut beans from the other groups, having the best appearance.

Burly, a vigorous leafy variety, yielded similarly to Cascade, the standard long podded variety for cutting and slicing. Burly has a rather curly pod, but is very wide and fleshy and has small seeds. It is thus very suitable for slicing.

P R E L I M I N A R Y T R I A L - I 9 8 8

Varieties in this trial are either on, or entered for National List in an EEC member country, and several seemed promising.

Seventeen varieties were evaluated including the standards. All short podded varieties yielded well. Arena was the most promising variety in this group. Growth was vigorous and pods were well distributed on the plant and held well off the ground. Pods of Arena were slightly longer and wider than Gitana the standard short podded variety. Both gave attractive processed samples. Lione had short plants, flowering was prolonged and it appears cold sensitive, giving lower yields.

Masai, one of the newer generation of the very fine bean types yielded well compared with those evaluated in the Screening Trial. Pods were straight and of uniform size.

Several slim intermediate podded varieties were evaluated but none outyielded Nerina at the freezing stage. Adora was lower yielding but produce was slimmer and a little darker than Nerina and gave an attractive sample when quick-frozen whole. Maestro, a vigorous variety, yielded well. However, pods were uneven in colour and size and several suffered from constriction caused by seed abortion. Swing yielded slightly lower than Nerina, but pods were slimmer, straight and with an even colour. Pods were evenly distributed on the plant which made picking easy. WAV 581 was low yielding, pods were slimmer than Nerina and straight, but prone to wind scarring. Rovita had a less vigorous plant habit than Nerina and pods were darker and slimmer, but their maturity and size were uneven. Firato was late maturing and had a compact plant habit, but pods were tangled and concentrated in the middle of the plant. Pods were finer than Nerina.

Of the varieties suitable for cutting and slicing, only WAV 499 had pods of similar length to the standard Cascade. This variety performed very well (as in 1987) in terms of yield, pods were very straight with good colour although flowering and hence pod maturity was a little uneven. Dark seeded XPB 200 yielded well, but the pods appeared prone to wind scarring. RO 8621 was a tall vigorous erect variety with pods widely spread on the plant and held off the ground. Yields of RO 8621 were low and this variety suffered from split flowering and pods were very uneven in maturity and colour. There were also some flat pods in the sample.

7/1988

Irina had a poor plant habit and several pods touched the soil. It was a late maturing variety. This variety performed better at the CFDRA site.

Varieties selected for further evaluation in the 1989 Main Trial were Arena, Masai, Swing, WAV 499 and Irina.

SCREENING TRIAL - 1988

There were three interesting short podded varieties in this trial, Araldo, 342 pV 7.1 and 342 pV 7.3 which had slightly longer but very fine pods. These three varieties were all paler than the standard Gitana. 342 pV 7.1 and 342 pV 7.3 yielded similar to Gitana, but both had a split flowering period. Pods were set near the top of the plant and were thus vulnerable to wind scarring. Processed samples of 342 pV 7.1 seemed slightly better than 342 pV 7.3. Araldo was lower yielding, but pods were straight and neat.

Of the two new intermediate 'Nerina' types, PV 447, were of similar colour but finer and with not such a round cross section as Nerina, and were straight and uniform in size. Pods of PV 432 had a glossy skin and a bright colour, but there were several rather flat pods in the sample.

In the intermediate podded group, no variety performed better than Groffy. PV 441 had straight pale pods, similar in appearance to Groffy, but yields were slightly lower. Plants were tall and not as erect as Groffy. Yields of Hama and Cherif were poor and both suffered from split flowering and uneven maturity. Pods were wind scarred and Cherif had rather curly pods.

The standard long podded variety Cascade, gave low yields as a result of poor establishment. WAV 598 had a rather lax plant habit and maturity was uneven. Pods were slightly shorter than Cascade and not very straight, they were also quite slim and therefore unsuitable for slicing.

Very fine bean varieties, such as Faria and Cabri, are grown in France to give a high quality product. They are machine harvested and size graded into 'extra-fins', less than 6.5 mm pod width (with high premiums paid) and tres fins less than 8 mm. These types have a maximum pod width of 8.5 mm and length about 13 cm. The pods are not processed whole, but are cut to fall within a specification, which for the 'extra fins' grade is 6 cm.

The screening trial included a few of these very fine bean varieties, including some grown previously at Thornhaugh. Yields were low since the plots were harvested very early to achieve the 6.5 mm pod width grade. The produce was graded by hand. All varieties had a split flowering period, possibly an effect of poor cold tolerance, but Cabri appeared most sensitive. Growth of Cabri was also checked by the pre-emergence herbicide and plants were short. Callide was not very vigorous and pods trailed on the ground. Callide and Faria gave particularly attractive samples and the best yields.

8/1988

Pods of Cabri were the least straight, and Clyde the greatest pod width. Clyde had a good plant habit with pods held well above the ground.

DEMONSTRATION AREA - NORFOLK

Varieties from the Main Trial and a range from several seed companies grew well on a demonstration area sown near Aylsham, Norfolk. The demonstration event was cancelled due to an outbreak of Halo blight (Pseudomonas syringae pv. phaseolicola) in the humid conditions in one trial variety. This also occurred in 1985 and highlights the importance of plant breeding for resistance to Halo Blight. There were no infections in the Thornhaugh trials, which were demonstrated on 22nd August.

GREEN BEAN VARIETY STUDIES Summary of Agronomic Data - Green Bean Main Variety Trial, Thornhaugh - 1988
 Varieties placed in order of maturity within each group. Standard varieties underlined. All varieties sown on 16th May.
 Results are means of three replicates. Target population 40 plants/m². Row width 30 cm.

Variety	At Practical Freezing Stage		At Practical Canning Stage		Plant habit 1=lax 5=erect	No. of pods touching soil 1=most 5=none	External colour (raw)	Shape 1=v.curved 5=straigh	Average length cm			Section width mm			
	Maturity Yield (± days) as % of relative Groffy to Groffy	Maturity Yield (± days) as % of relative Groffy to Groffy	F	C					F	C	F	C	F	C	
<u>Short Podded</u>															
Odessa (025)	HS	5278	- 2	95	- 1	93	4	4.7	10.0	10.0	4.5	8.3	8.4		
Laureat	As	5898	0	73-	- 1	82-	5	4.6	10.3	10.8	4.2	8.4	8.6		
Lasso	PV	5006	0	99	0	105	5	4.6	9.9	10.1	4.4	8.7	8.9		
Mirel	PV	4864	+ 1	85	+ 1	88	5	4.4	10.5	10.4	4.4	8.4	8.8		
<u>Gitana</u>	RS	7091	+ 3	91	+ 3	96	4	4.5	10.1	10.1	4.5	8.6	8.9		
<u>Intermediate Podded - Whole</u>															
Celero	Ni	6457	- 4	80	- 4	89	5	4.8	11.2	11.4	4.2	8.7	9.5		
Merina	RS	4304	0	85	+ 1	112	5	4.6	13.3	13.3	4.7	9.5	10.0		
<u>Sentry</u>	As	4607	+ 3	100	+ 3	110	3	4.7	13.1	13.2	4.7	9.3	9.6		
<u>Intermediate Podded</u>															
Groffy	Nun	3189	0	100	0	100	5	4.8	13.0	13.2	4.9	11.2	12.0		
			(14/8)	(16.0t/ha)	(17/8)	(17.9t/ha)									
<u>Long Podded</u>															
Cascade	Bk	2630	+ 2	105	+ 2	113	4	3.9	16.4	16.7	5.0	12.5	12.8		
<u>Burly</u>	Rog	2441	+ 3	112	+ 3	108	3	3.9	15.4	15.4	5.0	13.6	13.6		
Significance @ P = 0.05				SD		SD			SD	SD		SD	SD		
LSD @ P = 0.05				28.3		28.4			0.66	0.46		0.36	0.26		
C of V %				17.9		16.7			3.2	2.2		2.2	1.5		

KEY: P = pale; M = medium; D = dark
 F = Freezing Stage; C = Canning Stage
 - Significantly less than Groffy

Short pods (10 cm or less) suitable for freezing or canning whole; freezing stage SL 80; canning SL 90
 Intermediate pods (10 - 13 cm length; less than 9.5 mm width) for freezing whole or cutting; freezing stage SL 90; canning SL 110
 Intermediate pods (10 - 13 cm length) suitable for cutting (or slicing); freezing stage SL 90; canning SL 110
 Long pods (more than 13 cm length) suitable for cutting or slicing; freezing stage SL 100; canning SL 120

GREEN BEAN VARIETY STUDIES Summary of Agronomic Data - Green Bean Preliminary Variety Trial, Thornhaugh - 1988
 Varieties placed in order of maturity within each group. Standard varieties underlined. All varieties sown on 23rd May.
 Results are means of three replicates. Target population 40 plants/m². Row width 30 cm.

Variety	At Practical Freezing Stage			At Practical Canning Stage			No. of pods touching soil	Pod Characteristics						
	Source	Seeds /kg	Maturity (+ days) relative to Groffy	Yield as % of Groffy	Maturity (+ days) relative to Groffy	Yield as % of Groffy		Plant habit	External colour (raw)	Shape	Average length cm	Section		
												1=erect	5=erect	1=v-curved
<u>Short Podded</u>														
Arena	Nun	4937	- 1	90	- 2	95	5	M	4.9	10.6	10.7	4.6	9.2	9.2
Lione	Nun	5220	+ 2	89	+ 1	81	3.5	M/D	4.8	9.4	9.5	4.5	8.9	9.2
Gitana	RS	7091	+ 2	87	+ 1	88	5	M/D	4.7	9.6	9.8	4.0	8.6	8.7
<u>Filet Type</u>														
Masai	S&G	5863	0	74	0	78	5	D	4.6	10.1	10.2	3.8	7.4	7.5
<u>Intermediate Podded - Whole</u>														
Adora	Nun	5116	0	70	- 1	71	5	M/D	4.6	10.7	11.3	4.7	8.6	8.9
Nerina	RS	4304	0	104	0	95	5	M/D	4.6	12.8	13.0	4.3	8.9	9.3
Maestro	PV	5491	+ 1	93	0	107	4.5	M	4.5	10.7	11.0	4.0	9.0	9.2
Swing (PV 331)	PV	5373	+ 2	90	+ 1	88	5	M	4.6	10.9	11.1	4.5	8.5	8.4
WAV 581	VW	5550	+ 2	76	+ 2	70	4.5	M	4.5	10.9	11.8	4.4	8.1	8.3
Rovita (RS 1350)	RS	4623	+ 2	79	+ 2	104	5	M/D	4.5	12.3	12.5	4.2	8.7	9.2
Firato (PV 325)	PV	5972	+ 5	85	+ 5	90	5	M	4.5	10.5	11.0	4.4	8.2	8.3
<u>Intermediate Podded Groffy</u>														
	Nun	3189	0	100	0	100	5	P/M	4.8	12.8	13.1	4.9	11.0	11.8
			(18/8)	(15.6t/ha)	(22/8)	(17.9t/ha)								

Cont/.....

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(Cont)

GREEN BEAN VARIETY STUDIES Summary of Agronomic Data - Green Bean Preliminary Variety Trial, Thornhaugh - 1988
Varieties placed in order of maturity within each group. Standard varieties underlined. All varieties sown on 23rd May.
Results are means of three replicates. Target population 40 plants/m². Row width 30 cm.

Variety	At Practical Freezing Stage		At Practical Canning Stage		No. of pods touching soil	Pod Characteristics				
	Seeds /kg	Maturity Yield (\pm days) as % of relative Groffy to Groffy	Maturity Yield (\pm days) as % of relative Groffy to Groffy	Canning Stage		External colour (raw)	Shape	Average length cm	Section Pod	
					1=lax 5=erect	1=v.curved 5=straight	F C F C	1=flat 5=round		
Long Podded										
<u>XPB 200</u>	As	+ 2	106	+ 2	4	4.5	M/D	4.9	11.6	12.0
Cascade	Bk	+ 3	114	+ 2	4	3	M	4.9	12.5	12.6
<u>WAV 499</u>	vW	+ 4	104	+ 4	4	4	M/P	4.7	11.6	11.7
RO 8621	Rh	+ 4	80	+ 5	5	4.8	P/M	4.9	11.5	11.7
Irina	vW	+ 5	92	+ 5	4	4	M/D	4.3	9.7	10.0
Significance @ P = 0.05			SD				SD	SD	SD	SD
LSD @ P = 0.05			20.7					0.65	0.49	0.34
C of V %			13.8					3.3	2.8	3.1
										2.1

KEY: P = pale; M = medium; D = dark

F = Freezing Stage; C = Canning Stage

+ Significantly greater than Groffy; - Significantly less than Groffy

Short pods (10 cm or less) suitable for freezing or canning whole; freezing stage SL 80, canning SL 90
Intermediate pods (10 - 13 cm length; less than 9.5 mm width) for freezing whole or cutting; freezing stage SL 90, canning SL 110
Intermediate pods (10 - 13 cm length) suitable for cutting (or slicing); freezing stage SL 90, canning SL 110
Long pods (more than 13 cm length) suitable for cutting or slicing; freezing stage SL 100, canning SL 120
Filet types (10 - 13 cm length; less than 8.5 mm width) suitable for freezing whole or cutting. Size graded on the continent, a premium for grade less than 6.5 mm width

GREEN BEAN VARIETY STUDIES Summary of Agronomic Data - Green Bean Screening Variety Trial, Thornhaugh - 1988
 Varieties placed in order of maturity within each group. Standard varieties underlined. All varieties sown on 8th June.
 Results are means of two replicates. Target population 40 plants/m². Row width 30 cm.

Variety	At Practical Freezing Stage		At Practical Canning Stage		Maturity Yield as % of relative Groffy	Yield as % of relative Groffy	Plant habit	No. of pods touching soil	External colour (raw)	Pod Characteristics					
	Maturity relative to Groffy	Yield relative to Groffy	Maturity relative to Groffy	Yield relative to Groffy						Shape	Average length	Section	Pod width		
										F	C	F	C		
Short Podded															
Araldo	Ni	4876	+ 1	57-	0	68-	4	4	M	4.6	10.1	10.4	3.4	7.9	8.2
Gitana	RS	7091	+ 1	72-	0	76-	4	4	M/D	4.8	9.4	9.9	4.0	8.1	8.5
342 pV	7.1 Bk	5296	+ 2	72-	0	73-	4	5	M/P	4.7	10.7	10.6	3.8	7.4	8.0
342 pV	7.3 Bk	4533	+ 2	72-	0	70-	4	5	M/P	4.8	10.4	10.6	3.7	7.5	8.0
Very Fine Podded Types															
Clyde	S&G	7200	- 4	32-	- 5	36-	5	5	M/D	4.5	12.1	12.2	3.7	7.6	7.9
Faria	S&G	5426	- 4	69-	- 5	63-	5	5	M	4.7	10.4	10.9	2.8	7.0	7.4
Cabri	Cl	9038	- 3	32-	- 4	55-	4	4	M	4.2	12.1	12.9	3.1	6.9	7.3
Callide	(MIV 701)Cl	7966	- 3	54-	- 5	56-	5	5	M	4.7	12.4	12.7	3.0	7.1	7.1
Intermediate Podded - Whole															
PV 447	PV	5851	0	98	0	98	5	5	M/D	4.8	12.0	12.8	3.4	7.9	8.2
Nerina	RS	4364	- 1	74-	0	81	5	5	M/D	4.6	12.1	12.2	4.5	9.0	9.2
PV 432	PV	3871	+ 3	78-	+ 3	89	4	4	M/D	4.7	11.8	12.5	3.8	9.2	9.9
Intermediate Podded															
PV 441	PV	2785	- 1	94	- 1	98	3	3	P/M	4.7	13.3	14.6	4.8	11.2	12.0
Groffy	Nun	3189	0	100	0	100	5	4	P/M	4.8	12.2	12.8	4.8	11.4	12.2
Hama	Ni	3528	+ 1	65-	+ 1	(16t/ha) 78-	4	3	M/P	4.9	12.1	12.3	4.4	10.2	11.4
Cherif	(MIV 310)Cl	3114	+ 1	57-	+ 1	(3178) (18.8t/ha) 82	3	5	M	4.4	12.2	12.9	4.0	9.5	10.5

GREEN BEAN VARIETY STUDIES Summary of Agronomic Data - Green Bean Screening Variety Trial, Thornhaugh - 1988
 Varieties placed in order of maturity within each group. Standard varieties underlined. All varieties sown on 8th June.
 Results are means of three replicates. Target population 40 plants/m². Row width 30 cm.

Variety	At Practical Freezing Stage		At Practical Canning Stage		No. of pods touching soil	External colour (raw)	Shape	Average length			Section			
	Maturity as % of relative Groffy to Groffy	Yield as % of relative Groffy to Groffy	Maturity as % of relative Groffy to Groffy	Yield as % of relative Groffy to Groffy				cm	F	C	F	C	1=flat	5=round
Long Podded														
WAV 598	0	91	0	89	3	M	4.2	14.3	14.6					
<u>Bk</u>	+ 2	<u>60</u>	+ 2	<u>57</u>	<u>3</u>	<u>M</u>	<u>3.8</u>	<u>14.9</u>	<u>15.2</u>					
<u>Cascade</u>		SD		SD				SD	SD					
Significance @ P = 0.05		16.8		21.9				0.76	1.64					
LSD @ P = 0.05		11.4		13.8				3.0	6.2					
C of V %														

KEY: P = pale; M = medium; D = dark ≠ poor establishment

F = Freezing Stage; C = Canning Stage

+ Significantly greater than Groffy; - Significantly less than Groffy

Short pods (10 cm or less) suitable for freezing or canning whole; freezing stage SL 80; canning SL 90
 Intermediate pods (10 - 13 cm length; less than 9.5 mm width) for freezing whole or cutting; freezing stage SL 90; canning SL 110
 Intermediate pods (10 - 13 cm length) suitable for cutting (or slicing); freezing stage SL 90; canning SL 110
 Long pods (more than 13 cm length) suitable for cutting or slicing; freezing stage SL 100; canning SL 120
 Filet types (10 - 13 cm length; less than 8.5 mm width) suitable for freezing whole or cutting. Size graded on the continent, a premium for grade less than 6.5 mm width

S U M M A R Y

B R O A D B E A N S

Evaluation of varieties tested in previous years continued and three new varieties were included in a Main Trial. They were compared with the standard variety Medes.

B R O A D B E A N T R I A L - 1 9 8 8

Seed of all varieties was treated with fungicide to control damping off diseases. The trial was sown into good seedbed conditions on 18th April. Emergence was good. Rainfall was frequent and above average in July, and growth was vigorous. NUN 7057 was the tallest variety and Talia and Brandy the shortest. No variety suffered from lodging however. Some varieties had a slight infection of chocolate spot (*Botrytis fabae*), and under warm humid conditions downy mildew (*Peronospora viciae*) developed in upper leaves of Medes, NUN 7057, NIZ 03440, Brandy and Talia, but neither disease became a severe problem. Harvesting began on 2nd August, and finished with the latest variety to mature, NUN 7057.

No variety yielded significantly higher than the large seeded standard Medes, but NIZ 03440 yielded significantly lower at freezing and canning stage.

The appearance of quick-frozen and canned samples of Medes, HS 500 and the slightly smaller seeded Brandy was good; the colour of Turbula was less attractive when canned without colour and the size was rather uneven. NIZ 03440 and NUN 7057 were a distinctive bright lime green in colour when frozen, but may be less suitable for canning. Seeds of both these varieties were medium/small with NIZ 03440 the more uniform. These two varieties may find a specialist market.

Talia was the most outstanding new variety in trial, gave high yields of attractive uniform small sized beans, slightly larger seeded than Beryl in previous trials.

BROAD BEAN VARIETY STUDIES Summary of Agronomic Data - Broad Bean Main Variety Trial, Thornhaugh - 1988
 Varieties placed in order of maturity. Standard variety underlined. All varieties sown on 18th April.
 Results are means of three replicates. Row width 30 cm & target population 18 plants/m².

Variety	Source	Seeds /kg	At Practical Freezing Stage			At Practical Canning Stage			Plant height cm
			Maturity (\pm days) relative to Medes	Yield as % of Medes	Mean length 10 beans mm	Maturity (\pm days) relative to Medes	Yield as % of Medes		
<u>Medes</u>	<u>Ni</u>	<u>920</u>	0 (2/8)	100 (7.2t/ha)	<u>207</u>	0 (8/8)	100 (10.3t/ha)	<u>106</u>	
Turbula	Ni/Zw	1019	0	96	175-	0	73-	121+	
Talia	Nun	1405	+ 1	101	156-	+ 1	85	93-	
HS 500	HS	956	+ 1	87	193	+ 2	90	100	
Brandy (SG 292)	S&G	1304	+ 1	99	176-	+ 1	76-	93-	
NIZ 03440	Ni	1480	+ 5	68-	168-	+ 4	57-	120+	
NUN 7057	Nun	1430	+ 6	105	170-	+ 5	77-	126+	
				SD	SD		SD	SD	
				32.0	12.5		16.2	8.6	
				18.4	4.0		11.0	4.5	

Significance @ P = 0.05
 LSD @ P = 0.05
 C of V %

* Maturity of Medes is normally 1 day earlier than Threefold White
 + Significantly greater than Medes; - Significantly less than Medes

Practical Freezing Stage TR 110 - 140 for a 140 g sample
 Practical Canning Stage TR 115 - 140 for a 56 g sample

N A V Y B E A N S

Recently progress has been made in developing navy bean varieties with better adaptability for the main USA production areas and new material was assessed at Thornhaugh, for cold tolerance, earliness, plant habit, harvestability and suitability for processing as canned 'baked beans'. These navy beans from the USA were compared with varieties bred in the UK for cold tolerance and earliness (and evaluated at PGRO in 1985).

S U M M A R Y

During the 1988 season temperatures were average or a little below average, except in July. Rainfall was frequent and navy bean growth was vigorous.

However, many varieties from the USA although vigorous, matured too late to be reliably harvested in the UK climate.

The varieties bred in the UK for earliness and cold tolerance Albion, Edmund, Marcus and Adrian were earlier than those from the USA breeding programmes, except for 84071. Albion was the earliest to mature, the first week in October, and yields were good. 84071 was the most promising variety, yielding well with an erect plant habit, and since pods were not too close to the ground, a little more easily harvested than most other varieties, and it was early harvested 4 days later than Albion (bred by Cambridge University).

Seed size of all varieties was not too different from the old standard Seafarer, and samples of navy beans canned in tomato sauce were all acceptable. However Botrytis infection caused high levels of waste and stain in some late harvested samples and/or where pods touched the soil. This reduced the quality of produce and involved extensive cleaning before processing

T R I A L - I 9 8 8

The emergence of some varieties was poor and plant counts were lower than target:- Seafarer, 6123, NAD 83043, NAD 85103, NAD 81228, NAD 83172, NAD 83070 and 82339.

Some varieties showed sensitivity to bentazone + oil application and suffered scorch. Seafarer was the most severely affected variety, and Rocket, Adrian, Marcus, U 158, 6137, 6123, NAD 81228 and NAD 83070 also appeared sensitive.

The first variety to flower was 84701 on 20th July, followed by Albion, Marcus, Adrian, Midland and Rocket, and next Edmund and Seafarer.

The tallest plants were SWD 84141, SWD 85096 and U 158, the shortest 6123, 6137, Marcus and Adrian.

There was a range of different plant habits and the best varieties, 84071, NAD 83070, SM 7926-1E and NAD 81228 were tall, vigorous and erect, with pods held higher above the ground than most varieties. These were easier to combine than the others, although all varieties were difficult to harvest.

Varieties bred in the UK had pods rather close to the ground, but were erect, and exhibited a branched plant habit, particularly Albion and Marcus. A few from the USA, 82339 and Rocket had very widely branched plants, while some had a narrower plant profile NAD 83043, NAD 83070, 84071; others had long runners which bound tall plants together so they eventually lodged U 158 (severely), U 125 (to a lesser extent), SWD 84141 and SWD 85096, so although the bottom pod was high up on the stem on tall plants, these pods were eventually close to the soil at harvest after lodging.

As the harvesting season progressed, senescence and drying out of the crop slowed down and the latest variety to mature was not harvested until 2nd November. The earliest maturing variety was Albion, followed by Edmund, and 84071; Marcus and Adrian matured four days later. All these were earlier than Seafarer.

The highest yielding variety in trial was SM 7926-1E, but it matured late. Of the early maturing varieties 84071 gave the best yields and yields of Albion were acceptable.

Botrytis infection and wet weather caused high levels of waste and stain particularly in varieties which were late harvested and/or where pods touched the soil SWD 84141, U 125, U 158 and SWD 85096, thus reducing quality of produce and involving extensive cleaning before processing.

Seed size of all varieties were not too different from the standard except for Marcus which was larger, and SWD 85096 which was rather small. SWD 83070 was uneven. Samples of all varieties canned in tomato sauce, gave very acceptable products with less breakdown than a commercial sample. The only varieties to suffer slight breakdown when canned were Midland, 82339 and U 125. Marcus beans were noticeably larger and rounder than the commercial sample.

NAVY BEAN VARIETY STUDIES Summary of Agronomic Data - Screening Trial - Thornhaugh - 1988
 Varieties placed in order of maturity. Standard variety underlined. All varieties sown on 18th May.
 Results are means of two replicates. Target population 40 plants per m² sown in five 30 cm rows.

Variety	Source	Seeds /kg	Maturity relative to Albion (\pm days)	Yield @ 16% MC t/ha	Straw length cm	Standing ability 5=erect 1=lax	Mean pod height above soil	Pods touching soil at harvest 5 = none 1 = most	Ease of harvest 9=v. easy 1=v. difficult	1000 grain wt. g.	% waste & stain
Albion	PBI	4611	0 (6/10)	2.46	40	5	12	4	2	242	6
Edmund	PBI	4738	+ 2	2.22	40	5	10	3	1	214	5
84071	Rog	6029	+ 4	2.76	47	5	20	5	3	203	14
Marcus	W	5000	+ 4	1.79	38	5	18	4	2	263	9
Adrian	W	5424	+ 4	1.36	39	5	12	3	1	219	14
<u>Seafarer</u>	<u>Mich</u>	<u>4787</u>	+ 5	1.55	40	5	12	3	1	233	26
<u>Midland</u>	<u>As</u>	<u>5469</u>	+ 7	2.05	40	5	10	3	1	201	18
6137	Ul	5821	+ 9	2.05	38	2	15	2	1	206	29
Rocket	As	4667	+10	2.14	40	5	13	4	2	251	24
NAD 83172	Rog	6343	+10	1.24	54	4	16	3	1	224	26
U 158	Ul	5464	+15	2.57	59	1	20	2	2	219	50
SM 7926-1E	Rog	5890	+15	3.24	52	5	26	5	3	199	51
U 125	Ul	6317	+16	2.67	53	2	23	3	2	208	55
NAD 83070	Rog	5052	+22	2.50	45	5	14	5	3	201	34
NAD 85103	Rog	5355	+22	1.62	49	3	15	4	2	245	39
NAD 83043	Rog	5903	+22	2.24	40	5	14	5	3	198	28
NAD 82118	Rog	6037	+22	2.29	50	4	17	5	3	169	49
SWD 84141	Rog	7089	+24	2.64	63	2	20	2	2	175	64
82339	Rog	6277	+24	1.97	40	5	15	5	2	204	28
SWD 85096	Rog	6322	+25	2.83	60	2	24	2	2	152	59
6123	Ul	5985	+27	0.81	33	5	12	3	1	185	24
Significance @ P = 0.05			SD								
LSD @ P = 0.05				0.322							
CV % of general mean				18.0							

F I E L D B E A N S

A series of field bean trials of white flowered varieties for the compounder was begun at Thornhaugh in 1986, and results of previous trials are available on request. Evaluation of spring and winter sown field bean varieties began in 1988 since information on performance on a light soil type of varieties at Recommended or National List stage was sought.

W I N T E R B E A N T R I A L - I 9 8 8

Varieties of winter sown field beans on or at Recommended List Stage of testing, plus IB 38 and Hiverna were evaluated on a fine sandy loam soil at Thornhaugh.

This trial was for PGRO members and not part of the National Recommended List series. Following a mild winter, plant populations were about 30 plants/m², much higher than the target of 20 plants/m².

Punch performed well in terms of yield; standing ability and hence harvestability was superior to the other varieties. Bourdon and Bulldog gave good yields, while those of Banner were lower; and yields of white flowered IB 38 and Hiverna were poor. All these varieties lodged severely. All varieties suffered from infection of chocolate spot (Botrytis fabae) and downy mildew (Peronospora viciae).

Yields of winter sown field beans were generally lower than spring varieties sown on an adjacent area.

20/1988

S P R I N G S O W N F I E L D B E A N T R I A L - I 9 8 8

Varieties of spring sown field beans at Recommended List and some at National List stage of testing evaluated at Thornhaugh on a fine sandy loam soil. This was a trial for PGRO members' and not part of the National RL series. Control varieties were Troy, Alfred, Maris Bead and Corton.

The highest yielding varieties Frinebo, Gobo, Corton and Faneta were late maturing, suffered from stem breakage and were the most difficult to harvest. Alfred was an exception and was high yielding, early and easily harvested. Troy yielded similarly to the mean of control varieties, but has an advantage of being the earlier, and is short strawed and easy to harvest. It appears susceptible to chocolate spot and downy mildew however. Albatross, white flowered and tannin free, is more acceptable to the compounders for animal feed, and yielded better than several Recommended varieties.

Tigo and Fritel, the determinate Ti beans were the shortest strawed and easily harvested but they appeared susceptible to chocolate spot and rust, and in spite of high populations (and high seed costs) yields were significantly lower than the mean of control varieties.

WHITE FLOWERED BEANS
FOR THE COMPOUNDER - 1988

For a third year a replicated experiment was carried out at Thornhaugh on a free draining light soil to evaluate white flowered, tannin-free, Vicia faba varieties from field bean or broad bean breeding programmes. Some were at early stage of development. All were spring sown with the exception of one white flowered winter bean grown adjacent to the trial. They were compared with spring sown coloured flowered field beans Troy, Alfred and Minden.

The most outstanding white flowered variety was Albatross which gave higher yields than the mean of coloured flowered controls this year, and yields were statistically similar to Troy and Alfred. It seemed relatively free from disease, but suffered stem breakage which reduced harvestability. Toret also yielded similarly to Troy and Alfred, and was harvested a little earlier than Albatross. Although Toret is a short strawed variety with fine stems it lodged this year. 88902 looked promising, yields were good, and the short plants were easily harvested.

Although Blandine, Dame Blanche and 69005 did not yield as well as other varieties they were easily harvested. 69005 was very early.

BTW had a poor plant habit and lodged severely and was low yielding. Albinette is also of less interest because the seed is large and flat and hence difficult to drill with conventional cereal drills. While winter white flowered IB38 has the attribute of being desirable to the compounder the yields were very low and harvesting difficult.

Coloured flowered beans were difficult to market in 1988, and over-production is likely in 1989. Thus when supplies of seed of white flowered varieties become generally available to the grower (in 1991), it is possible that the tannin-free produce, which is more acceptable to the compounder, might command a higher price.

Samples of produce from the trial were made available to compounder members for analysis and feeding studies.

WINTER FIELD BEAN VARIETY STUDIES - Summary of Agronomic Data, 1987/88.

All varieties sown on 26th October, 1987. Results are means of 4 replicates.

variety	Source	Plant population plants/m ² 7/12	Final population plants/m ² 15/3	No. seeds/kg.	Maturity days earlier(-) or later(+) than Banner	Yield @ 14% MC t/ha	Straw length (cm)	% no. plants lodged on 23/8	Ease of harvest 9=easy 1=difficult	Thousand seed weight (g)	Disease scores 5=severe 0=none Chocolate Downy Spot Milde
Bourdon	PBI	32	32	1208	+ 1	4.76	192	100	2	-	5
Banner	PBI	26	27	1153	0(5/9)	4.01	194	100	2	-	4
	Significance @ P = 0.05					NSD	NSD				
	SD @ P = 0.05					-	-				
	CV %					14.9	1.9				
March	PBI	32	31	1730	+ 3	4.95	182	60	4	755	3
Willdog	PBI	31	32	1200	+ 4	4.72	176	100	2	755	3
38	PBI	29	29	1328	- 3	3.53	191	90	2	755	4
Verona	Sem	25	24	1445	0	3.12	187	100	2	737	3
	Significance @ P = 0.05					SD	SD				
	SD @ P = 0.05					0.774	9.47				
	CV %					11.9	3.2				

All varieties were sown on the same date, but Bourdon and Banner were sown and randomised in an adjacent block and were analysed separately.

SPRING FIELD BEAN VARIETY STUDIES - Summary of Agronomic Data 1988.

Control varieties underlined. All varieties sown on 5th March. Results are means of three replicates
 Yields are given as a % of control varieties Troy, Alfred, Maris Bead and Corton.

Variety	Breeder (UK Agent)	Final population plants/m ²	No. seeds/ kg	Maturity days earlier(-) or later(+) than Troy	Yield % of controls @ 14% MC	Straw length cm	% No. plants brackled on 23/8	Ease of harvest 9 = easy 1 = diffi- cult	Thousand seed weight g	Diseasescores on 28/7			
										5=severe	Chocolate spot	Downy mildew	Rust
Troy	Lem (Wh)	41	1866	0 (30/8)	100	142	0	8	501	3	3	3	4
Alfred	Ceb (Ni)	42	1976	+5	105	157	5	7	566	1	1	1	2
Victor	Ceb (Ni)	42	1396	+6	93	147	5	8	541	1	1	3	3
Fritel	VEB (Bk)	69	1835	+6	81	116	0	8	550	3	3	0	4
Nabor	Fr (HA)	41	1680	+7	92	167	80	5	504	1	1	1	2
Albatross	Lem (Twy)	40	1434	+8	102	153	70	5	648	1	1	1	2
Maris Bead	BBI(PBI)	40	2287	+8	90	170	90	4	408	1	1	0	1
Minden	Pet (Ni)	41	2651	+9	100	169	30	5	435	2	2	1	2
Tigo	VEB (Bk)	69	1978	+9	69	116	0	8	539	3	3	0	3
Corton	(Sem)	40	1689	+10	106	181	100	3	518	2	2	1	1
Gobo	VEB (Bk)	42	1942	+10	107	185	100	3	514	1	1	1	1
Faneta	VEB (Bk)	41	2316	+12	106	192	90	3	503	2	2	1	1
Frinebo	VEB (Bk)	41	2317	+13	108	182	100	4	560	2	2	1	1
Sapphire	VEB (Bk)	42	1768	+17	93	181	90	3	531	1	1	2	1

Mean Yield of Troy, Alfred, Maris Bead & Corton t/ha 6.07

Significance @ P = 0.05 SD

LSD @ P = 0.05 10.02

CV % 6.2

SD

29.22

3.3

Key: Ti = topless determinate type.

W = white flowered

- Significantly less than mean yield of control varieties

WHITE FLOWERED FABA BEAN VARIETY STUDIES Summary of Agronomic Data
 All varieties sown on 2nd March 1988, except winter bean IB38 on 26th October 1987. Plant population 40 plants/m².
 Results are means of three replicates. Yields are given as a % control varieties Troy, Alfred and Minden, all coloured flowered

Variety	Plant pop. pl/m ²	Breeder (UK Agent)	Seed weight 1000 (g)	Maturity days earlier(-) or later(+) than Troy	Yield % of controls @ 14% MC	Straw length (cm)	Brackling & (lodging) at harvest	Ease of harvest 9=easy 1=diffi- cult	1000 grain weight (g)	Disease scores 28/7 5= severe 0=none
<u>Spring beans</u>										
Troy	C 39	Lem (Wh)	455	0(30/8)	105	155	0 (0)	8	523	3 3
Alfred	C 40	Ceb (Ni)	503	+ 5	101	164	5 (0)	7	580	2 1
Minden	C 40	Pet (Ni)	444	+ 7	95	175	70 (0)	5	474	1 3
Sapphire	C 41	VEB (Bk)	565	+17	94	185	90 (0)	3	552	2 2
Albatross	W 41	Lem (Twy)	697	+ 9	108+	167	90 (0)	5	678	2 1
Toret	W 39	Ni (Ni)	751	+ 7	99	131	5 (60)	4	733	1 1
Austrian	W 40	-	354	+ 6	94	141	90 (0)	6	435	1 1
88902	W 41	-	606	+ 6	94	142	0 (0)	8	614	1 1
Albinette	W 42	HS (Bk)	894	+ 7	90-	131	0 (0)	6	978	2 2
Blandine	W 42	INRA (Mar)	598	+ 8	89-	157	(70) (0)	8	659	1 1
BTW	W 39	PBI (PBI)	511	+ 7	81-	153	100(100)	2	595	2 0
69005	W 41	Mar (Mar)	510	+ 3	80-	139	0 (0)	8	528	3 1
Dame Blanche	W 40	Joo (ICI)	640	+ 7	75-	168	0 (0)	8	681	2 4

Mean yield of control varieties Troy, Alfred and Minden t/ha 6.103

Significance @ P = 0.05
 LSD @ P = 0.05
 SE as % general mean

SD 13.8
 6.2
 SD 46.16
 5.5

Winter bean	W 30	PBI	754	+ 3	58 <th>191</th> <th>50(100)</th> <th>2</th> <th>755</th> <th>5</th> <th>0</th> <th>3]</th>	191	50(100)	2	755	5	0	3]
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KEY: C = coloured flowered; W = white flowered
 -Significantly lower than; +Significantly higher than the mean of control varieties Troy, Alfred and Minden
 [IB38] data not statistically analysed, grown in plot adjacent to the trial but not randomised

A P P E N D I X

Full Postal Address

<u>Code</u>		
As	Asgrow Seed Company, 9634-190-31 7000 Portage Road, Kalamazoo, MI 49001,	U.S.A.
BK	Booker Seeds Ltd., Boston Road, Sleaford, Lincs.,	U.K.
Ceb	Cebeco-Handelsraad, 31 Blaak, Postbus 182, 3000 AD, Rotterdam,	Holland
Cl	Société Clause, Comptabilité, 1 Avenue Lucien Clause, 91220 Bretigny, Cedex,	France
Fr	Dr. Franck, c/o Pflanzenzucht Oberlimpurg, S-7170 Schwabisch Hall, Postfach 590,	W. Germany
HA	Harlow Agricultural Merchants, Latchmore Bank, Little Hallingbury, Bishops Stortford, Herts, CM22 7PJ.,	U.K.
HS	Holland Select BV, P.O. Box 27, 1619 ZG Andijk,	The Netherlands
ICI	ICI Seeds (UK) Ltd., Marsh Lane, Boston, Lincs. PE21 7RR,	U.K.
INRA	INRA, BV. 1540, 21034 Dijon Cedex,	France

<u>Code</u>		
Joo	J. Joordens Zaadhandel BV, Schijfweg Noord 5, Postbus 7823, 5995 ZG Kessel (Lb),	Holland
Lem	Hans-Georg Lembke KG, Norddeutsche Pflanzenzucht, D-2331 Hohenlieth, Post Holtsee U Eckernforde,	W. Germany
Mar	The Breeding Station "Maribo", P.O. Box 32, DK-4960, Holeby,	Denmark
Mich	Michigan State University, Dept. of Crop & Soil Sciences, Plant & Soil Sciences Building, East Lansing, Michigan 48824-1325	U.S.A.
Ni	Nickerson RPB Ltd., Rothwell, Lincoln LN7 6DT,	U.K.
Nun	Nunhems Zaden BV., Postbus 4005, 6080 AA Haelen,	Holland
PBI	Plant Breeding International, Maris Lane, Trumpington, Cambridge CB2 2LO,	U.K.
Pet	F. von Lochow-Petkus GmbH, Postfach 1311, D-3103 Bergen 1,	W. Germany
PV	Pop Vriend BV, P.O. Box 5, 1619 ZG, Andijk,	Holland
Rh	Fa H. Rhode Samenzucht, Ellenberger Strasse 12, 3501 Guxhagen,	W. Germany
Rog	International Group, Rogers Brothers Seed Co., P.O. Box 4727, Boise, ID 83711-0727,	U.S.A.
RS	Royal Sluis BV, P.O. Box 22, 1600 AA, Enkhuizen,	Holland

<u>Code</u>		
Sem	Semundo Ltd., Unit 55, Clifton Road, Cambridge CB1 4FR	U.K.
S & G	Sluis & Groot BV, P.O. Box 13, Enkhuizen,	Holland
Twy	Twyfords Seeds Ltd., Scotts Farm, Kings Sutton, Banbury, Oxon, OX17 3QW.,	U.K.
UI	University of Idaho, Research Extension Center, Route 1, Kimberly, Idaho 83341,	U.S.A.
vW	van Waveren Pflanzenzucht,GmbH, D-3405, Rosdorf, Uber Gottingen,	W. Germany
W	Institute of Horticultural Research, Wellesbourne, Warwick, CV35 9EF.,	U.K.
Wh	Wherry & Sons Ltd., South Street, Bourne, Lincs. PE10 9LU.,	U.K.
	Department of Applied Biology, University of Cambridge, Pembroke Street, Cambridge, CB2 3DX,	U.K.

