NEW VARIETAL RELEASES

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The Navy Bean Marketing Board and Queensland Department of Primary Industries has tentatively approved the seed increase of two new lines (both from the Actopan Sanilac cross) selections 37 and 46. These lines will be released subject to continued good performance and developments in the PMV situation.

Selection 37 is an early maturing line with an average size seed similar to Gallaroy. Selection 46 is a late maturing line with a high yield potential. Seed size is rather small and similar to Kerman and California Small White.

These new lines appear to be better suited to areas away from the main growing area of the South Burnett than the varieties available at the present time. In the main growing area this material was considered for release some time ago. However, at that time all beans were grown in the South Burnett area and the varieties available were performing satisfactorily. Although other districts do not recognise any major problems in the South Burnett area these lines will shatter and the seed becomes brittle after maturity.

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PEANUT MOTTLE VIRUS

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Mr. G. McCarthy, Plant Pathologist, Kingaroy and Mr. G. Behncken, Virologist, Brisbane are to screen all 63 selections maintained from the C. S. W. Sanilac and Actopan Sanilac crosses with PMV in the coming season to see if any of the material possesses resistance.

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CORRELATING SEVERAL PLANT CHARACTERS WITH YIELD AND CRUDE PROTEIN CONTENT IN VARIETIES OF PHASEOLUS VULGARIS L.

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The main aim of the Cambridge University grain legume project, sponsored by the British Overseas Development Administration, has been

to assemble high yielding, high protein, day neutral genotypes of P. vulgaris suitable for use as parental material in the tropics. The Cambridge collection of some 3,500 living accessions was screened in 1969 and 1970 on a single plant basis to pick out those genotypes having the determinate habit of growth and day neutrality. Approximately 400 varieties were considered suitable for further screening and were grown as single rows in 1971. These were further screened for protein content and yield, the latter by the crude procedure of seed produced for yield testing in 1972.

64 varieties were grown in 1972 in an 8 x 8 triple lattice and several characters were measured to see whether they could be used as an indirect method of screening for either yield or protein content. The characters measured were, number of plants which emerged, date of emergence, date of first flowering, date of maturity, leaf size, height, 100 seed weight, seed yield and crude protein content. The results are given in the table below.

Correlations of several plant characters with yield and crude protein content in 64 determinate varieties.

	Nos. which emerged	Date of emergence	Date of flowering	Date of maturity	Leaf size	Height	100 seed weight
Seed Yield	0.63***	-0.43***	-0.31*	-0.42***	-0.12	-0.00	-0.30*
Protein content	-0.07	0.12	0.34**	-0.12	-0.23	-0.18	-0.12

* significant at 5.0%, ** at 1.0%, *** at 0.1%.

It was also found that there was a small, significant negative correlation of -0.31* between yield and crude protein. The best positive correlation was between numbers which emerged and seed yield but even in this case only 40% of the variance was accounted for, suggesting that varieties which had poor emergence were in part able to compensate for this. The high yielding varieties, in general, emerged, flowered and matured earliest, although the correlations were low in all cases. There was no relationship between leaf size or height with yield. As these characters, in part, determine canopy structure, no simple relationship between photosynthetic capacity and yield can be postulated from these data. There was a small negative relationship between seed yield and seed size. In the case of crude protein content, the only significant relationship was with flowering date. On average the late flowering lines had slightly higher protein contents.

The 64 varieties used in this investigation originated in 21 different countries and differed in many characters. They therefore represent a wide range of genetic diversity and the results are

unlikely to be seriously biased due to sample choice. From the low values of the correlations obtained it should be possible to select out recombinants having any desired combination of the characters studied. The current breeding programme will test this hypothesis.

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CORRELATING CRUDE PROTEIN PERCENTAGE WITH SEED YIELD IN SEGREGATING GENERATIONS OF P. VULGARIS CROSSES

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In an investigation to evaluate the genetic diversity in bean varieties from the Cambridge collection, eight varieties were chosen on the basis of differences in a number of characters e.g., growth habit, seed size, photoperiod response and protein content. These varieties were crossed in an 8 x 8 diallel in 1970 and the parents, 56 F_1 families and 56 F_2 families were grown in a field trial of spaced plants in 1971.

The present account reports data from two of the varietal crosses, low x low (L x L) and high x high (H x H) crude protein content.

Low protein varieties	Origin	Seed size (mg)
Higuerillo (HG)	S. America	650
Prelude (PL)	Europe	400
High protein varieties		
Chimbolo (CH)	C. America	150
Gratiot (GR)	U. S. A.	200

The crude protein percentage (N x 6.25) was determined in seed of the parent plants and in subsequent generations, including the reciprocals. Seed yield was determined (gm) from spaced plants in the field trial. The results are given in the tables below.

Low protein lines	N	Mean yield per plant (g)	S.D.	Mean % protein	S.D.
HG	21	19.96	6.84	23.1	0.21
PL	19	11.01	4.37	25.0	1.04
HG x PL F_0	5			(F_1) 18.4	0.99
PL x HG F_0	5			22.1	0.42
HG x PL F_1	14	28.69	7.76	(F_2) 23.1	1.37
PL x HG F_1	26	17.30	6.50	24.5	1.42
HG x PL F_2	19	17.73	7.25	(F_3) 23.1	2.26
PL x HG F_2	13	20.17	8.86	22.4	2.54