Performance of new field pea plant types

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In an effort to make the field pea a more easily managed and harvested crop, new plant types are being produced with markedly different morphology and reproductive development. The first stage of this breeding programme aims to produce semi-leafless, semi-dwarf plants with clustered, non-shattering, pods. Yield testing of new plant types has commenced to identify high yielding lines that can be used as parents in further crosses.

Methods

Progeny from the first series of crosses involving semi-leafless (af) and semi-dwarf (le) genes were field tested in 1983 at Horsham (450 mm rainfall and Ug 5.2 soil type) and Walpeup (335 mm rainfall and Gc 1 soil type). Both trial designs were randomised block with three replications. Plots were 5 m by 6 row, sown with a cone seeder at 150 kg/ha. Superphosphate, herbicides and insecticides were used according to standard practice.

Results and Discussion

Four plant type classes were represented in the trials: conventional (C), semi-leafless (SL), semi-dwarf (SD) and semi-leafless + semi-dwarf (SL/SD). Results are presented for the top 35 out of 120 lines at Horsham and 24 out of 72 at Walpeup grouped according to these classes (Table 1). At both sites high yielding SL/SD plant types were found indicating that some of these lines were well adapted to the environment. In 1983 the lack of spring frosts and the favourable growing season meant there was no significant correlation between maturity type and yield.

Table 1. Yields (t/ha) of four plant type classes at two sites for lines that yielded at least 95% of controls (Dun at Horsham, Dundale at Walpeup)

Plant type	Horsham			Walpeup		
	No. lines	Range	Average	No. lines	Range	Average
C	11/49*	3.2-4.7	3.8	10/39	2.1-2.9	2.5
SL	1/8		3.4	4/8	2.3-3.2	2.7
SD	19/41	3.1-4.9	3.7	9/20	1.9-3.1	2.3
SL/SD	4/22	3.5-4.2	3.7	1/5		2.3

*Number of high yielding lines/number of lines sown.

The rationale behind using the semi-leafless trait is that plants will form an interlocking upright network that will be quicker and easier to harvest.

Two factors observed in these trials qualify this. First, nearly all SL lines stood well until the end of flowering, but then most lodged completely. Only a few lines exhibited some ability to stand at harvest. The difference appeared to be related to stem structure. Second, the degree of tendril growth varied according to pedigree, so that some lines formed a much stronger network than others. Hence, strength of stem at harvest and precocity of tendrils are complementary to the semi-leafless trait in producing the

desired upright plants at harvest.

Lines with clustered (fa fas hr) and non-shattering QE v) pods, in addition to the semi-leafless, semi-dwarf traits, will be yield tested at a number of sites in 1985.