INHERITANCE OF PROTEIN CONTENT IN PEA. IVb. PERFORMANCE OF PLANTS GROWN FROM WHOLE SEEDS AND FROM HALF SEEDS

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Our use of the half-seed technic in breeding research prompted us to ask if and in what way the plants which grew from halves of seeds differ from "normal" plants which grew from whole seeds. To answer this we set up an experiment involving a randomized block design with 6 replications, 3 lines of peas (Wt 3026, Wt 3527, Wt 4042), and two ways of plant propagation. Plant growth rate was analyzed on the basis of the length of stem measured at 3 stages of development. Seed yield and % protein content were analyzed as well.

To compare the rate of growth of plants derived from half seeds (HS) with that of plants grown from whole seeds (WS) plant height was measured when the plants were at the 2-3 leaflet and 4-5 leaflet stage of development and then at maturity. Multivariate analysis of variance (MANOVA) revealed that, except for the 2-3 leaflet stage, there was no interaction between ways of propagation and lines.

In the majority of cases HS plants were in all stages slightly smaller than WS plants; however, the differences were statistically significant (at the 0.05 level) at the two first stages of development but not at maturity. (Table 1).

Table 1. Length of stem of three lines of pea in different stages of development comparing plants grown from whole seeds (WS) and from half seeds (HS).

Stage of plant development	Wt 3026		Wt 3527		Wt 4042	
	WS plants	HS plants	WS plants	HS plants	WS plants	HS plants
2-3 leaflets	4.9	3.9	3.3	3.2	5.4	4.3
4-5 leaflets	14.4	11.2	9.4	7.3	17.8	14.4
Maturity	48.1	49.4	40.9	35.8	108.5	100.2

Besides growth rate, components of yield and % protein content were studied (Table 2). A very low protein content, caused by the excess of rainfall in 1980, is noteworthy. In normal years protein content for Wt 3026 is about 29%, WT 3527 - 22%, and WT 4042 - 27%. The MANOVA showed no interaction between ways of propagation with lines for all characters analyzed or for protein content. Moreover, although the mean number of pods and mean seed yield in HS plants were slightly lower than in WS plants, the differences were not significant.

Altogether the present results plus the high germination rate (96%) for the HS plants indicate that the HS method is a promising research tool.

Table 2. Mean values for yield components and for % protein content in WS plants and HS plants.

Characters	Wt 3026		Wt 3527		Wt 4042	
	WS plants	HS plants	WS plants	HS plants	WS plants	HS plants
Number of internodes	14.2	16.4	16.6	16.3	19.3	17.6
Number of pods/plant	7.3	6.9	9.1	6.9	10.4	7.0
Mean number of seeds/pod	3.0	2.8	3.0	2.8	3.2	3.4
TGW (g)	272.9	253.0	221.3	218.9	195.9	200.4
Seed yield/plant (g)	6.03	5.00	6.48	4.30	7.03	4.97
% Seed protein (Nx6.25)	20.1	19.9	15.7	16.2	16.9	15.7