TEMPERATURE DEPENDENT BEHAVIOR OF A CHLOROPHYLL MUTANT OF PEAS

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Four years ago, I marked a white seedling in my spring pea crop. This plant eventually turned green, and its progeny appeared to be normal in the fall crop. Subsequent investigation has revealed that it was homozygous for a recessive gene which controls chloroplast pigment development in a temperature dependent manner. Homozygotes develop no photometrically detectable chlorophyll or carotenoids when maintained at temperatures of 8°C or less, regardless of light intensity or day length. However, exposure of very young leaves to 20°C in light or dark for as little as 48 hr is sufficient to induce development of near normal pigment levels after return to 8°C. The upper three leaves on all plants in the accompanying photograph went through this critical stage at 20°, 8°, and 20°, respectively.

Dr. Blixt has assigned type No. 222S to this mutant, and he is testing it for allelism with other chlorophyll mutants. He informs me that some measure of temperature dependence among many, if not most, of the known chlorophyll mutants of peas can be inferred from his own field observations.

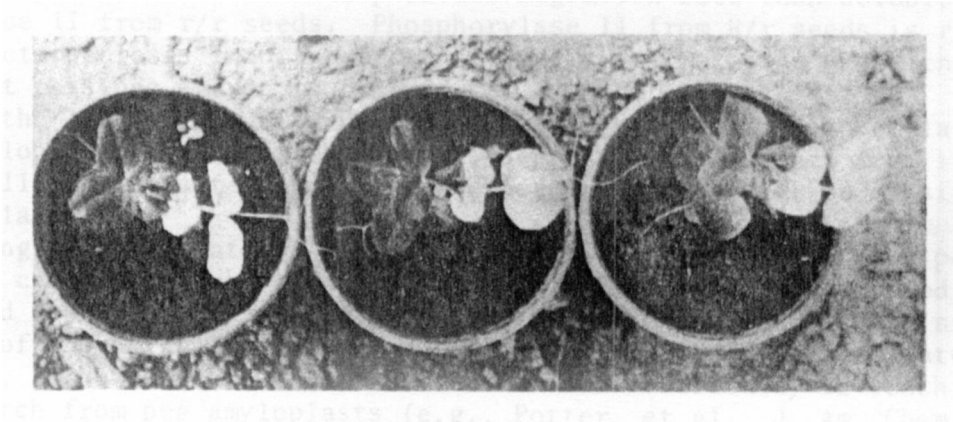

Fig. 1. Chlorophyll mutant showing sensitivity to temperature.