(Table 2). Thus, all growth inhibition of untreated plants was due to chlorflurenol since the plastic chamber atmosphere contained no factor(s), e.g. increased ethylene levels (10), that limited growth. Growth inhibition occurred in beans placed in the greenhouse within 30 cm of chlorflurenol-treated plants (Table 2), indicating the importance of the volatility effect. More chlorflurenol-induced growth inhibition was observed in plastic chambers than in the greenhouse (Table 2). This may be due to volatile chlorflurenol concentrating within the confines of the plastic chamber.

These results indicate that chlorflurenol can be transferred from treated to untreated bean plants presumably by volatilization. The apparent volatility effect of chlorflurenol is suggested since other factors such as photochemical and/or microbial breakdown of the retardant were not investigated (9). Future work may show differences in plant responses due to environment and species; however, the chlorflurenol volatility effect was observed on *Acer rubrum* L. and *Fraxinus pennsylvanica lanceolata* Marsh. seedlings grown in the greenhouse (J. R. Frank, unpublished data).

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Peanut Plants from Single De-embryonated Cotyledons or Cotyledonary Fragments[1]

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Abstract. **A method has been developed to produce normal peanut plants from de-embryonated peanut cotyledons and cotyledonary fragments without the use of liquid nitrogen.**

Peanut plants have been successfully produced from de-embryonated cotyledons (1). Cotyledons which are razor-cut or simply broken by hand tend to show damage and autolyze readily. The liquid nitrogen caused the cotyledonary material to separate or cleave under shock with minor or no damage to individual cells, thus minimizing or eliminating autolyzation. I now report a cotyledon culture technique that eliminates the need for liquid nitrogen.

I observed that if peanut seeds were placed in a moist chamber until the cotyledons turn green and the embryo sprouts, the cotyledons will develop a leathery-feel or texture. The embryo may then be safely removed and by slowly and gently applying breaking pressure to a cotyledon, it will separate or cleave without damage. The whole or broken cotyledons, when placed again in the moist chamber, produce leaves and roots and develop into normal plants. Fourteen of these plants were transferred out of doors where they grew to maturity and produced normal peanuts.

The moist chamber was a square glass box 20 x 20 x 7 cm with a tight lid. The seeds were placed between double layers of paper toweling thoroughly dampened with tap water. The temperature ranged from 16-21°C and the lighting was a 100 watt frosted bulb at about 1.2 cm distance from the box.

The only strain of peanut used was a small Spanish-type identified as number 6212 by Burpee Seed Company. An average of 80 to 90% of whole cotyledons will produce plants. Only 1 to 2% of small fragments are successful.

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Floral Anatomy of *Phaseolus vulgaris* L. cvs. Gallatin 50 and Oregon 58[1]

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Abstract. **Anatomical and morphological studies were made on 'Gallatin 50' and 'Oregon 58' bush snap beans. The first leaf primordium was observed 3 to 4 days after planting. Four or 5 leaf primordia were formed in spiral phyllotaxy with plastochrons lasting 1 day or less. The first floral primordium occurred in the axil of the uppermost leaf 7 to 9 days after planting. Floral parts became discernible 5 days later.**

Anatomy of determinate cultivars of *Phaseolus vulgaris* have been reported previously (1, 2, 3, 5, 7, 8). Ojehomon (7), and Ojehomon and Morgan (8) found the floral primordium in the axil of the uppermost leaf differentiated into the first triad on the plant irrespective of the no. of leaves on the main stem. However, Leopold (5) reported that floral initiation started from the cotyledon and progressed upwards. On the contrary, Inoue and Shibuya (3) showed the flower buds formed simultaneously throughout the plant.

In spite of the fact that many (1, 2, 3, 5, 7, 8) have reported on morphology and anatomy of beans, no information was available on developmental anatomy of a shoot and contradictory

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