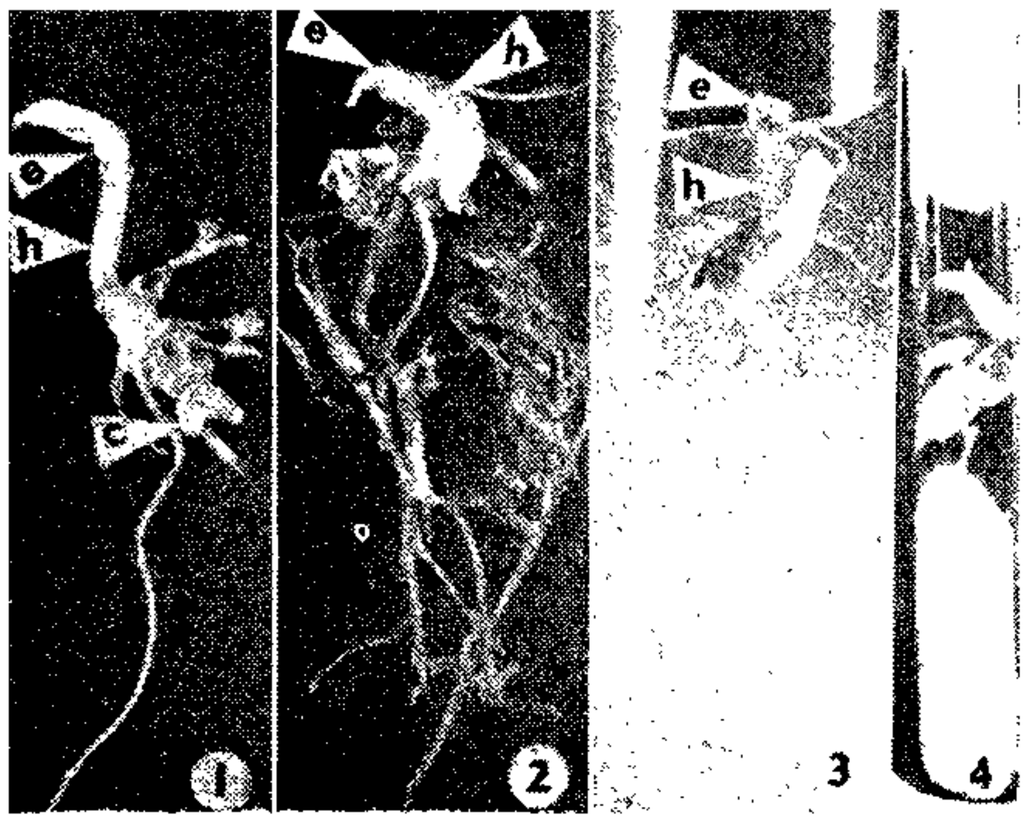
in the same period. The shoot bud wilted and dried up after 40 days and the roots were not numerous. Cultures grown with the addition of 0·5 mg./l. of FA exhibited a more or less similar course of development. Concentrations of 0·75 mg./l. and 1 mg./l. inhibited the growth of shoot buds very early. In these cases the embryos indicated a stunted shoot bud. However, the hypocotyl enlarged and its lower end was ruptured due to the development of roots. In about ten per cent of the cultures grown on 1 mg./l. concentration of FA the first leaves of the epicotyl expanded but ultimately wilted and dried up. The root system in such cases was not well developed and the rootlets were not produced (Fig. 3).



FIGS. 1–4. Fig. 1. 15-day-old embryo axis of *P. vulgaris* grown on medium containing 0·25 mg./l. of FA, × 1. Fig. 2. Embryo axis grown on medium containing 0·75 mg./l. of FA, × 1. Fig. 3. Wilting of leaf in culture grown with the addition of 1 mg./l. of FA, × 1. Fig. 4. Control grown on NBV without the addition of FA, × ¼. *h*-Hypocotyl ; *e*-Epicotyl ; *L*-Wilted leaf.

The results of this study indicate that in low concentrations FA induces callus formation while at higher concentrations the marked effect was inhibition of shoot growth. The wilting of the first leaves produced by a small percentage of cultures is associated with the scanty development of rootlets and hence the slow movement of FA into the shoot. But when the roots elongate FA may be transported to the leaves which ultimately wilt and dry up.

I am grateful to Professor T. S. Sadasivan for facilities and encouragement.

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December 3, 1966.

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A NOTE ON CYCOCEL (2-CHLOROETHYL TRIMETHYL AMMONIUM CHLORIDE), A NEWLY RELEASED PLANT GROWTH REGULANT

CYCOCEL, a newly released plant growth regulant, is indicated to produce unusual and varied responses on a wide range of plant species. The nature and behaviour of this growth regulant and its possible applications in crop production are yet to be fully evaluated. Hence it was of interest to study the effects of this chemical on plant growth and development using beans (*Phaseolus vulgaris*) as the test plant.

Effect of Cycocel on Germination of Seeds and Rooting.—Fifty bean seeds were placed on paper towels completely wetted with 100 p.p.m. of cycocel solution, for germination. This facilitated continuous contact of seeds with the chemical throughout their period of germination and rooting. Simultaneously placed bean seeds on paper towels wetted with distilled water provided the needed controls for comparisons to be made. Observations made revealed that cycocel does not affect (*a*) germination, (*b*) rooting and (*c*) formation of root hairs. However, elongation or extension of top and lateral roots was considerably reduced. Profuse formation of laterals and their early initiation in seeds germinating on paper towels soaked with cycocel were noteworthy. Since seeds germinated and roots were initiated, it is reasonable to assume that the chemical does not affect early cell division, multiplication and differentiation. The early initiation of laterals and thickening of roots probably reflect acceleration of differentiation and maturation of cells and tissues in roots. The effect of cycocel on length of roots and number of laterals produced is summarised in Table I.

TABLE I

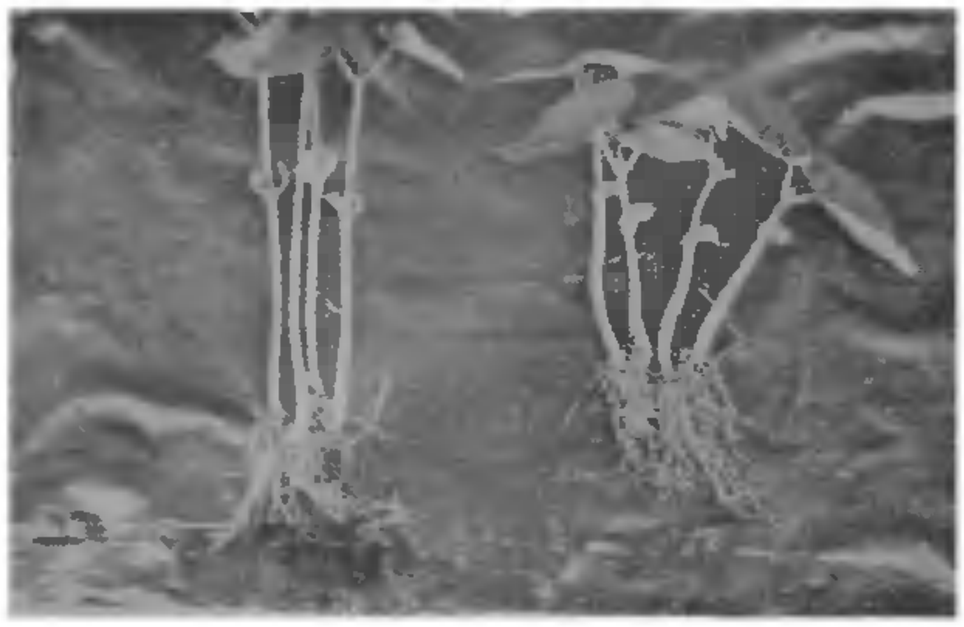
Treatments	Length of tap roots (in cm.)	Length of laterals (in cm.)		No. of lateral roots present
		Max.	Min.	
Cycocel ..	4·6	3·8	1·1	2
Control ..	9·8	4·4	1·5	7

Note : The data represent one taken on 5th day after commencement of the experiment and an average from 56 germinated seeds in each case.

Effect of Cycocel on Emergence, Early Growth and Development of Seedlings.—Wooden flats of 18" × 13" × 3½" filled with approximately ¼th c.ft. of potmixture were treated with 250 ml. of 5000 p.p.m. of cycocel, applied as a soil surface

spray, per flat Following applications of the chemical, 25 bean seeds were sown per flat. Non-treated controls were provided. Watering was done once a day throughout the experiment to provide the adequate moisture needed for germination of seeds and growth of seedlings. The experiment was terminated when the first pair of leaves were fully expanded.

Observations made revealed that soil applications of cycocel produced short, stocky, heavier plants with large sized leaves and compact root system (Photograph 1). Some of the



PHOTOGRAPH 1. *Left*: Control. *Right*: Cycocel-treated.

Note:—Application of cycocel results in short, stocky plants with a compact root system and large leaves. Note the thickening of basal part of stems and reduction in length of epicotyl and hypocotyl portions of stems. Photograph of bean seedlings taken 10th day after commencement of experiment. Cycocel was applied to soil at the time of seedling.

growth measurements, that were significantly influenced by cycocel, are tabulated below:

TABLE II

Growth measurements made		Cycocel	Control
1. Height of plant	(in cm.) ..	9·2	14·7
2. Length of leaf	(„) ..	5·5	3·9
3. Width of leaf	(„) ..	5·4	3·8
4. Length of petiole	(„) ..	1·7	2·0
5. Fresh weight of leaf	(in mg.) ..	498·0	258·0
6. Fresh weight of plant	(in gm.) ..	2·271	2·122

Data represent one taken on 10th day after commencement of experiment, and an average from 25 seedlings selected at random for each treatment.

It was also interesting to note that in many of the seedlings, the stem portion below the cotyledons (hypocotyl portion) was considerably thick with increased diameter as compared to controls. If cycocel as in the case of beans could produce similar responses in common vegetables and ornamentals, it could be applied to nursery beds at the time of seeding.

While growth regulants like mallic hydrazide (MH) could completely inhibit vegetative growth and gibberellins could act as a general growth promoter it is rather interesting to note that cycocel behaves in somewhat an unusual manner. On the one hand it has inhibited the elongation of main stem and tap root but on the other hand has contributed to increase in size of leaves and diameter of stems. Even with regard to leaves while cycocel has increased expansion of leaf blades, it has reduced the length of petioles. The selective responses of plant parts and tissues to cycocel deserve attention.

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A NEW APHID HOST OF *APHELINUS MALI* (HALDEMAN) IN INDIA*

THE Eulophid parasite, *Aphelinus mali* (Haldeman), was originally introduced into India from England in 1937 to control the woolly aphid, *Eriosoma lanigerum* (Hausmann), in the Punjab (Rahman and Wahid Khan, 1942). Later, it was also released in the Pomological Garden, Coonoor, Madras State, for the same purpose (Cherian, 1942). In both areas the parasite became well established within a short time. So far, there appears to be no record of the parasite attacking any other host in India. In March 1964 small colonies of *Aphis gossypii* Glover were found infesting the weeds *Bacopa monnieri* (L.) Pennel (Scrophulariaceæ) and *Rotala leptopetala* Koehn. (Lythraceæ) in some localities at Bangalore. Some of the aphids were found to be parasitized. *A. mali* was obtained from aphids on *B. monnieri* and another *Aphelinus* sp. from aphids on both the weeds. The present record of another aphid host of *A. mali* is interesting. It shows that the parasite is no longer restricted to *E. lanigerum* or to the localities in India where it was released to control this pest. Rahman and Wahid Khan (1942) offered 13 other aphids (which did not include *Aphis gossypii*) to *A. mali* for oviposition but none was accepted. Thompson (1953) has listed *Aphelinus gossypii* Timb., *A. semiflavus* How. and *A. varipes* Forst. as parasites