mature inflorescences revealed a seed set of only about 10%.

Seed sterility in the family Poaceae has been previously recorded in *Hilaria belangeri* and *H. mutica*[12] and *Digitaria decumbens*[13]. In *H. mutica* and *H. belangeri*, the degeneration of embryo sac in a large number of ovules (85% in *H. mutica* and 65% in *H. belangeri*) before fertulization has been suggested to be the cause of seed sterility. In the present material the degeneration of the archesporial cell, megaspore tetrad and 4-nucleate embryo sac has been observed in some ovules with no indication of the aposporous development of the embryo sac. However, the percentage of such ovules is very low (about 6%) and this factor alone cannot, therefore, account for high seed sterility. The course of meiosis in the present material is perfectly normal with nearly 100% pollen fertility[3]. The germination of the pollen grains and the entry of the pollen tubes into the stigmatic hairs has been observed. However, in most of the ovules, there was no evidence of the pollen tube in the embryo sacs which were healthy and apparently mature. Thus it appears that the seed sterility in *D. sindicum* may be due to (i) the failure of the pollen tube to reach the embryo sac in most of the ovules and (ii) failure of normal megasporogenesis and megagametogenesis in a low percentage of ovules.

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STUDIES ON THE RESPONSE OF ACID LIME (*CITRUS AURANTIFOLIA* SWINGL.) TO VESICULAR ARBUSCULAR MYCORRHIZAE

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There are many reports about the beneficial and symbiotic association of vesicular arbuscular mycorrhizal fungi (VAM) with *Citrus* spp. (Mosse[1], Gerdemann *et al.*[2] and Nemec and Patterson[3]). In order to study the effect of VAM on acid lime an experiment was conducted at the Horticultural Research Station, Periyakulam, during 1979–80 using two VAM species, *viz.*, *Glomus mosseae* (Nicol and Gerd.) Gerd. and Trappe and *Glomus etunicatus* Becker and Gerd. Cultures of *G. mosseae* and *G. etunicatus* were maintained on sterilised soil containing root tissue of previous plant hosts. Inoculation was done on six month old seedlings of acid lime raised in unsterilised soil under usual nursery practices. Two methods of inoculation were adopted *viz.*, top and bottom using 20 g of soil inoculum of VAM per plant. In the bottom method the inoculum was applied to the root zone through a hole made in the soil. For top inoculation, the surface soil in the pot was removed upto 1–2 cm and the VAM culture was applied around the stem and covered with sterilised soil. Phosphorus at 300 ppm of P_2O_5 per plant was drenched as diammonium phosphate solution at 15 ml per plant. Growth parameters were taken on one year old seedlings, six months after inoculation. The data are presented in Table I.

It may be seen that both the VAM fungi have significantly increased shoot height, stem thickness, number of leaves, root length, root weight besides shoot weight. The fungi in combination with phosphorus were also found to significantly enhance the growth and vigour as seen from the data on the growth parameters in these treatments when compared to no treatment (control) and phosphorus alone. Among the two methods of inoculation, top inoculation was better than the bottom inoculation. Similar results were obtained by O'bannon *et al.*[4] and O'bannon and Nemec[5] on *Citrus limon* and Nemec and Patterson[3] in carizo citranges.

One of the bottlenecks encountered in the production of pre-immunised acid lime seedlings against citrus tristeza virus at Periyakulam was the slow growth and the thin stem of the seedlings even one year after sowing. The present study indicates that the use of VAM can be exploited for producing mycorrhizal

TABLE I

Growth parameters in one year old acid lime seedlings, six months after inoculation (mean of 3 replicates)

Treatment	Type of inoculation of VAM	No. of leaves per seedling	Shoot height cm	Stem thickness cm	Root length cm	Shoot weight g	Root weight g
G. mosseae	T	49·5	50·3	2·13	43·8	12·5	5·1
G. etunicatus	T	47·3	49·2	1·93	47·1	11·8	4·5
G. mosseae	B	41·0	43·7	2·07	51·3	10·1	4·1
G. etunicatus	B	39·7	47·9	1·83	46·7	9·7	3·5
G. mosseae + P	T	41·0	47·3	1·93	45·5	10·3	4·5
G. etunicatus + P	T	39·0	44·5	1·90	44·8	9·7	3·3
G. mosseae + P	B	40·7	51·7	1·80	47·6	12·3	4·6
G. etunicatus + P	B	41·7	44·1	1·80	46·5	9·8	3·9
P. alone	..	39·7	42·2	1·60	42·6	9·3	3·6
Control (no treatment)		33·0	39·2	1·56	34·4	7·6	2·2
SED		0·4179	0·1432	0·0468	0·3211	0·2192	0·1268
CD		0·8780	0·3010	0·0983	0·6747	0·4607	0·2664

T—Top inoculation; B—Bottom inoculation; P—Phosphorus.

acid lime seedlings which may become suitable for grafting earlier than normal seedlings.

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A SIMPLE AND RAPID METHOD OF SCREENING STOMATAL DISTRIBUTION AND TRICHOMES IN CASSAVA

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CASSAVA (*Manihot esculenta* Crantz) is generally raised as a rainfed crop and is presently finding increasing importance in drought prone regions. When germplasm is maintained under rainfed conditions, screening the genetic stocks for drought resistance becomes rather difficult unless they are subjected to different intensities of water stress. However, ecological anatomy of leaves is generally considered to be an indicator towards the drought resistant potential of the plants.

A number of factors are known to be associated with drought hardiness in plants[1,2]. The number of stomata per unit area in the leaf, the number of stomata which actually remain open under the field conditions, the capacity of stomata to respond quickly to water stress and the distribution of hairs are some of the important factors which determine the drought resistance of the varieties. As a preliminary measure, the germplasm was screened for stomatal distribution and hairiness. However, the difficulties experienced in obtaining satisfactory epidermal peelings impeded quick screening of germplasm thus necessitating the development of a simple technique for rapid screening for stomatal distribution and trichomes in this crop.

The desired leaflet is smeared with Fevicol—a synthetic adhesive resin having SH bond. The adhesive should be applied only as a thin film on the surface of the leaf. The smeared leaflet is allowed to dry for about an hour. Later, the film of the adhesive can easily be peeled off (Figs. 1, 2) and directly studied under the microscope. The stomatal distribution, its size and shape can be elegantly studied from the impressions on the adhesive peelings and the observations are comparable in all respects with the norma