

TABLE I  
Leaf mutations in EMS and MMS treated peas

Treatment	Generation	Unequal leaflets %	Small leaflets %	Leaflets with acute apex %	Leaflets with obtuse apex %	Total %
EMS 0.25%	M <sub>1</sub>	1.8	0.6	0.6	0.3	3.3
	M <sub>2</sub>	0.3	nil	0.9	0.3	1.5
	M <sub>3</sub>	nil	nil	1.5	1.2	2.7
MMS 0.025%	M <sub>1</sub>	0.18	0.17	0.11	nil	0.46
	M <sub>2</sub>	2.4	0.3	nil	0.3	3.0
	M <sub>3</sub>	0.6	0.4	0.4	nil	1.4

mutations segregated in M<sub>2</sub> and M<sub>3</sub> generations indicating that these were due to genic changes; but due to low plant populations no definite ratio could be obtained. However, a few investigators have reported the breeding behaviour in other plants. Segregation of leaf mutations in *Vicia faba* into unifoliata and normal types have been reported by Sjödin<sup>11</sup>. Patil and Bora<sup>10</sup> noted that small and narrow leaf mutants in groundnut were recessive in nature. Hammons<sup>4</sup> and Loesch<sup>7</sup> observed a 3:1 ratio in groundnut leaflet mutants. Besides, the genic segregation, cytological evidence indicates that the leaf mutations arise due to alterations in chromosome pattern as has been reported by Husted<sup>5</sup>, Mendes<sup>8</sup> and Gustaffsson and Gadd<sup>3</sup>.

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#### CHANGES IN THE FREE AMINO ACIDS OF CITRUS LEAVES IN RELATION TO CITRUS GREENING AND CITRUS CANCER

WITH a view to assessing the quantitative and qualitative changes in the amino acid composition of the diseased and the healthy plants, two commonly occurring diseases of commercially grown citrus were studied; canker disease on kinnow and greening disease of musambi were included in this study and the results are presented in this paper.

Healthy and diseased leaves of the same maturity were used for analyses. The method of extraction and determination of amino acids were the same as described by Rangaswami and Natrajan<sup>1</sup>. The data from the analyses are presented in Table I.

TABLE I  
Amounts of amino acids (in mg/g fresh leaves) in healthy and diseased leaves of kinnow and musambi

Amino acids	Kinnow (canker)		Musambi (greening)	
	Healthy	Diseased	Healthy	Diseased
Glutamic acid	1.1212	trace	0.728	0.627
Aspartic acid	0.1714	0.805	0.182	0.203
Serine	0.143	0.009	trace	0.084
Glycine	0.857	0.537	0.91	0.677
Asparagine	trace	trace	trace	trace
Proline	0.857	0.268	0.227	2.091
Methionine	0.143	0.089	trace	trace
Valine	1.1212	0.537	0.7705	0.338
Phenylalanine	0.428	0.805	0.546	0.340
Unknown	..	trace	..	..

The number of amino acids in both the diseased and healthy leaves is the same except in case of canker on kinnow an unknown amino acid was located. In general, the quantities of amino acids in the diseased leaves were lower than those of the healthy leaves. Increase in the quantities of amino acids in the canker affected kinnow leaves with corresponding decrease in musambi affected by greening was noticed in aspartic acid and phenylalanine. Contrary to this an increase in quantity of an amino acid in the disease over healthy in greening with corresponding decrease over control in canker was noted in serine and proline.

Thus the amino acid content of the leaves cannot be correlated with the disease in these plants.

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## REVIEWS AND NOTICES OF BOOKS

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**Methane : Proceedings of a One-day Seminar.**  
Compiled by Dr. Leo Pyle and Peter Fraenkel.  
(Intermediate Technology Publications. Ltd.,  
9 King Street, London, WC2E 8 HN, U.K.),  
1975. Pp. 51. Price not mentioned.

The recent escalation in the price of oil has led to a global energy crisis and has had a shattering impact on the economies of most of the developing countries. There has been the sudden realisation all over the world that the era of unlimited supplies of cheap energy is over. Therefore there is a great urgency for tapping alternate sources of energy and it is in this context that the Intermediate Technology Development Group (ITDG) in U.K. is doing commendable work. This group consisting of engineers, economists, scientists and others from industry and the professions is interested in the development of effective self-help techniques and low cost technologies using local

resources of the poor countries of the world. The group has set up a power panel to study the possible contribution to the energy supply of methane generation produced by the anaerobic fermentation of animal and vegetable wastes. In this small booklet under review are summaries of the proceedings of a one-day discussion meeting organised by this group. The range of papers discussed cover the development, manufacture and marketing of anaerobic fermenters. The summaries make interesting reading giving rise to the expectation that the day may not be far off when methane generation would play a vital role not only as a source of energy and fertiliser but also as part of the waste disposal cycle of rural communities. It is to be hoped that further developments in this field would find quick publication and be made available to all those interested in them.

K. M. SIVANANDAIAH.

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## TO ALL READERS OF CURRENT SCIENCE

In view of the Labour Strike in The Bangalore Press we are sorry we could not bring out the Journal for July 5, 1976 in time. The inconvenience caused is very much regretted.

Bangalore 56006  
July 15, 1976

Manager  
Current Science