

## Observations on 110 Citrus Cultivars Planted in an Area Severely Infested by Leaf Mottling

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CITRUS planted after 1957 in the vicinity of the Lipa Experiment Station, Batangas Province, Philippines, has been greatly damaged by leaf-mottling disease (3, 4). Almost all commercial plantings of Szinkom and Ladu mandarin have been destroyed. Typical field symptoms of leaf mottling resemble those caused by deficiencies of zinc and certain other micronutrients, but the most striking symptom is mottling of leaves. The disease is spread by a vector, the citrus psylla *Diaphorina citri* Kuw. (4). Consequently, there is more rapid dissemination of the disease in this area, where high populations of *D. citri* occur, than in other areas where population of the psyllid is low (1). The severe disease problem here is related to the presence of a large number of diseased trees serving as sources of inoculum and to a constantly high population of the insect vector (1).

It should be pointed out also that tristeza virus and its insect vector are omnipresent in the citrus-growing regions of Batangas Province and that there is a synergistic effect between the pathogens of tristeza and leaf mottling in seedlings (2). How much the presence of tristeza virus contributes to the decline of citrus

groves in the area is not known, but it may be considerable.

A program to find varieties that are resistant or tolerant when exposed to natural infection by the leaf-mottling pathogen, and incidentally by tristeza virus, is being carried out at the Lipa Experiment Station. Some preliminary results of this program are reported in this paper.

### *Materials and Methods*

For each of the 110 cultivars 8–10 seedlings, individually grown for 8 months in plastic bags, were planted in the field in June and July 1967 at 3 x 4 m spacing. All seedlings, selected to represent a variety in the field, appeared healthy, green, uniform in size, and had no visible symptoms of leaf mottling. Uniform care—including cultivation, soil management, and monthly spraying with recommended insecticides during the 6-month rainy season—was provided in all plantings. Monthly observations of individual plants were recorded; they include new growth (flushing), signs of leaf mottling or yellowing on mature leaves or new growth, presence of the citrus psylla (high or low populations), presence of known fungus and bacterial diseases, and presence of other pests and vegetative disorders. Plants hav-

ing a normal amount of new growth and no visual symptoms of stunting, mottling, or yellowing are rated to be apparently normal.

### *Observations and Discussion*

GROWTH RESPONSE BY GROUP OR SPECIES.—The growth response by group or species observed on 110 varieties 2 years after planting is summarized in Table 1. The different

mottling symptoms despite the high population of citrus psyllids. They have remained green and have grown normally since planting. Tolerant varieties suitable for rootstocks may not be useful in controlling the disease because rootstocks confer no tolerance to the scions of susceptible varieties (1). Leaf mottling is not considered to be a rootstock-scion disease, so it is also important

TABLE 1. INCIDENCE OF DISEASE AMONG THE TEST PLANTS AFTER 2 YEARS IN THE FIELD

Group or species	No. varieties	Total	Yellow		
			Healthy	mottled	Dead
Sweet orange	22	161	24	119	18
Mandarin	45	424	51	249	124
Lime, lemon, and sour orange	17	114	67	25	22
Pummelo and grapefruit	6	35	3	15	17
Trifoliolate orange and its hybrids	8	133	126	1	6
Miscellaneous and other hybrids	12	85	43	23	19

varieties may be ranked according to the largest number of plants with yellow-mottled leaves and stunted growth—typical field symptoms of the disease—in decreasing order as follows: sweet orange, pummelo and grapefruit, mandarin, and hybrids of mandarin and sweet orange. The largest number of plants without symptoms of leaf mottling was observed among selections of trifoliolate orange and its hybrids, the next largest among selections of lemon and sweet lime.

GROWTH RESPONSE OF CERTAIN INDIVIDUAL PLANTS.—Certain individual plants in the field have no leaf-

to find tolerant scion varieties in order to grow citrus successfully in areas where leaf mottling and high populations of the vector occur. Therefore, healthy appearing plants of scion varieties are being carefully observed. It has not been ascertained whether they are tolerant and will continue normal growth or whether they are merely escapees from natural infection. It should be noted, however, that these plants were observed to be continuously infested by citrus psyllids since planting time.

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