

DISCUSSION.

The factors which have contributed to the development of the present unsatisfactory state of tree growth may be conveniently divided into four groups: (1) The selection of unfavourable grove sites upon poorly prepared, impoverished soils which are characterized in part by undesirable physical conditions; (2) the use of all nursery stock produced; (3) the planting of the trees upon exposed eroded slopes; and (4) the lack of a definite co-ordinated plan of management.

The unfavourable weather experienced by North Auckland during the past three years has further intensified the effects upon the vigour of the trees brought about by the above-mentioned factors, so that the condition on many of the groves has become progressively poorer each year. Since it has been possible to correlate tree growth with soil types, recommendations on the elimination of areas which must be classified as being wholly unadapted to tung tree culture may be made, and suggestions on methods of raising the fertility level of the most suitable areas put forward.

In view of the present unsatisfactory condition of most of the established groves, and because of a complete lack of knowledge of the adaptability of American seed to New Zealand conditions, it is to be strongly recommended that further planting of tung trees in North Auckland, or in other sections which may perhaps prove to be climatically suited—*e.g.*, Coromandel, Tauranga, or Gisborne—should not be undertaken except upon a purely experimental basis and confined to plots of not more than a few acres established on a soil type that is representative of the whole projected area with respect to fertility, drainage, and exposure.

MOTTLE-LEAF OF CITRUS.

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The physiological disease known as mottle-leaf has been recognized for a long period in the citrus areas of the United States, but it was not until 1931 that it was shown to be induced by a deficiency of available zinc in the soil, and that sprays containing small quantities of zinc salts would correct the condition. Since the publication of the original papers numerous references have appeared in the agricultural literature of various countries to record the successful treatment of mottle-leaf of citrus, and associated diseases of other crops, by the use of zinc salts.

Citrus groves in many districts in the North Island have been found to contain trees which exhibit physiological symptoms that are closely comparable with those shown by trees affected with mottle-leaf. These symptoms, though not absolutely distinct from those induced by soil deficiencies of magnesium or sulphur, were considered to be sufficiently indicative to warrant the immediate establishment of experimental blocks of affected trees to which zinc sprays could be applied. Additional evidence in support of likely zinc deficiency was gathered from the differences in zinc content of leaves from affected trees as compared with samples taken from healthy trees. These analyses were carried out by the Chemical Laboratory, Department of Agriculture. Accordingly, trial plots were established initially by the Horticulture Division of the Department of Agriculture at Tauranga, and later in co-operation with the Plant Diseases Division of the Plant Research Bureau at Greenmeadows and Avondale, and at Whangarei. Although initial work has been confined to zinc, it is intended to establish a series of field experiments in which the effects of applications of salts of magnesium, sulphur, and others of the so-called minor nutrients can also be checked. It is hoped to lay down these trials in Avondale because of the extensive acreage of citrus planted on similar types in that district together with the widespread occurrence of the mottle-leaf condition on all varieties of citrus and of persimmons.
