Mineral Nutrition and the Size of Local Lesions Induced by Tobacco Mosaic Virus*

In connection with certain experiments dealing with the influence of mineral nutrition on the susceptibility of *Nicotiana glutinosa* to infection by tobacco mosaic virus, it was observed that certain treatments consistently altered the size of the local lesions produced on this host.

Essentially the same techniques as were employed previously for the culture of *N. tabacum* were used for *N. glutinosa* (*1*). Details will be published in a later communication. Calcium nitrate and magnesium sulfate were replaced by the corresponding sodium salts, magnesium sulfate was replaced by the chloride, and the iron salt was omitted to induce deficiencies of calcium, magnesium, sulfur, and iron, respectively. Five magnesium-deficiency experiments and four each of the other deficiency experiments were performed, with 32 to 80 plants per experiment. The experiments were carried out from 1952–54 at different seasons of the year. All plants in a particular experiment were inoculated after pronounced, characteristic deficiency symptoms (*2*) had developed.

Calcium and magnesium deficiencies had no apparent influence on the size of subsequently formed local lesions. Both iron and sulfur deficiencies, however, consistently produced larger lesions than those that developed on control leaves, by a factor of two to three estimated visually.

Samuel (*3*) observed that the response of *N. glutinosa* to infection by tobacco mosaic virus was markedly influenced by temperature. Local lesion size increased by increasing the temperature to 35°C; above this temperature no necrosis was observed, and systemic infection occurred. McKinney and Clayton (*4*) noted the production of mosaic symptoms at high temperatures in *Nicotiana* spp. carrying the factor for necrosis at 75°F, which agrees with Samuel's findings.

On *N. glutinosa,* tomato bushy stunt virus produces larger local lesions on young leaves than on old leaves (*5*). Apparently, on the basis of our findings, mineral nutrition can also influence lesion size. In addition, if increased lesion size in general represents a tendency toward systemic infection, mineral nutrition may affect the spread of plant viruses in a heretofore unrecognized manner.

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References and Notes

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Note on the Dating of Terraces in the Lake Melville District, Labrador

In the autumn of 1952 a large number of fossil trees were found in a bank of the Crooked River, about 40 mi north of Lake Melville near the head of Grand Lake, Labrador. These trees occurred in a deposit about 5 ft thick, 15 ft above the river level, and 25 to 30 ft above present-day sea level. There are more than 100 trees in this deposit and all are lying horizontally, where they have recently been exposed by the river's cutting back the bank. There is 10 ft of sand above the trees to the top of the terrace, while the bedded material below and around the trees is part clay, part sand. Although no marine shells were found in the bedded clays, in other terraces on the Hamilton River at this lower level the marine mollusks *Mytilus edulis* L. and *Saxicava arctica* were found. The specimens vary in size from small sticks to logs exceeding 1 ft in diameter; some appear to have been burned. The logs have been perfectly preserved in the damp sand and clay, and several samples were taken for dating by the carbon-14 method. They have not yet been specifically identified, but are large and massive, indicating vigorous growth.

The radiocarbon dates of these logs have been determined in the laboratories of the University of Saskatchewan under the supervision of K. J. McCallum. Tests on three different portions of the wood samples gave age values of 2022 ± 195, 2110 ± 245, and 1611 ± 217 yr. The average age was 1914 ± 127 yr. This set of samples bears the serial number S.1 in the Saskatchewan list.

This would indicate that there has been a rather slow rise of the land in this particular area (that is, a maximum of 25 ft in the last 2000 yr), unlike the areas around Hudson Bay where the rise is allegedly something of the order of 3 ft per century. The dates correlated in an interesting fashion with those reported by Potzger and Courtemanche from the James Bay district of Quebec [*Science* **119**, 908 (1954)].

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