

UPTAKE, DISTRIBUTION, AND METABOLIC FATE
OF RADIOACTIVE TETRAMINE IN THREE PLANT SPECIES

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ABSTRACT

Young seedlings of Douglas-fir (*Pseudotsuga menziesii* (Mirb.) Franco), trailing blackberry (*Rubus macropetalus* Dougl.), and orchard grass (*Dactylis glomerata* L.), grown in nutrient solution under controlled conditions, were treated with C¹⁴-labeled tetramethylenedisulphotetramine (C¹⁴-labeled tetramine). Treated plants were harvested from 2 hours to 60 days after treatment. Absorption, translocation, and metabolism of the tracer were followed by autoradiographic techniques, radiological assays, and chromatography.

C¹⁴-labeled tetramine was absorbed from nutrient solution by roots of the three species. Transport occurred via the transpiration stream and was apparently dependent on the area of transpiring foliage and the extent of the absorbing root system. Thus, upward movement was slowest in Douglas-fir and fastest in orchard grass.

After uptake by roots and deposition in plant tissue, C¹⁴-labeled tetramine did not recirculate within the plant via the phloem tissue. Immobility of the chemical was also demonstrated by lack of downward movement after foliar applications.

Appreciable amounts of C¹⁴-labeled tetramine appeared in blackberry flowers only when plants were treated after flower initiation had begun.

C¹⁴-labeled tetramine was metabolized in the plants. Radioactive carbon dioxide was liberated from treated plants in the dark, and extracts of some treated plants contained two C¹⁴-labeled metabolites in addition to the parent compound.

These results point to serious limitations against the use of tetramine to protect forest tree seedlings from damage by animals. Complete evaluation of the chemical, however, must await further study.

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