sufficient solubility in water to reach lethal concentrations in the liquid environment of the microorganism, or the material may be incompatible with the organism's environmental medium and precipitate or otherwise be rendered ineffective. If the site of action is within the cell the material might not be able to penetrate the cell membrane. Tagging the experimental material would provide data concerning all the above by simple separation techniques and counting of fractions wherefrom percentage incorporations can be calculated. An analog or homolog of the material could then be chosen that possessed either a greater degree of water solubility or characteristics that will permit a more intimate association of the material with the cell.

Defoliant Action Needs Study

In the field of herbicides much already has been covered concerning the selective hormone type of materials. It appears that little if any fundamental work using radioisotopes has been accomplished in the field of defoliant-type chemicals. Such materials are presumed to accelerate the formation of an abscission layer between the leaf and stem of a plant, causing the leaf to break away from the plant earlier than it would naturally. This layer is a formation of cells, quite brittle in character and may be formed through the action of a plant auxin. A number of chemicals including the xanthates and cyanamides will hasten formation of this layer either by an action of their own on the plant or by the stimulation of plant auxins. Either of the above chemicals could easily be tagged by using radioactive sulfur or radioactive calcium, respectively, in their synthesis. The material might be expected to move into the leaf and concentrate in the abscission layer causing the formation of the easily fractured cell layer.

Such movement readily could be ascertained by sectioning the stem longitudinally and exposing the layer to film. One might presume that the defoliating effect was primarily due to the chemical itself if no evidence of movement into the stem was observed. If movement into the stem without localization was observed, one might presume that the plant auxins caused the formation of an abscission layer to prevent the further entry of toxic material into the plant. Along with such data one would also determine in the same experiment much practical data on absorption under varying conditions of relative humidity, soil moisture, and other environmental factors.

In retrospect, one realizes that a notable and extremely useful tool has been added to the laboratory. The work already accomplished with radioisotopes assures an era ahead that is almost unlimited.

TECHNICAL SECTION

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