The disappearance of 2,4-dichlorophenoxyacetic acid (2,4-D) and other plant growth-regulators from soils has been shown to be due to microbial action. Martin (6) inoculated sterile media, containing 2,4-D as the only source of energy, with fresh soil and soil previously incubated with 2,4-D and then measured CO$_2$ evolution. Less CO$_2$ was evolved from media inoculated with fresh soil than with previously incubated soil. The quantities of CO$_2$ evolved were sufficient to indicate that 2,4-D is decomposed to a certain extent by soil microorganisms. Brown and Mitchell (2) found that the inactivation of 2,4-D was greater in nonautoclaved soil than in autoclaved soil. DeRose and Newman (3) showed that there was no detectable decrease in the biological activity of 2,4-D and other plant growth-regulators in autoclaved soils during 9 to 15 weeks incubation, whereas, all activity had disappeared in non-autoclaved soils in 3 to 6 weeks. These results indicate that microbial decomposition is the principal involved in the disappearance of growth-regulators from soil.

Soil moisture and soil temperature (2, 3, 5), and addition of energy material to soil (2) have been shown to influence the persistence of 2,4-D. The persistence of other plant growth-regulators has been found to be influenced by soil temperature and moisture (3), which have been the only factors studied.

The objectives of these investigations were (a) the influence of pretreatment of soil with various organic compounds on the persistence of 2,4-D, (b) the influence of rate of treatment with 2,4-D on its persistence, (c) changes in concentration of 2,4-D during the decomposition process, and (d) the decomposition of 2,4-D in liquid media by mixed and pure cultures of soil microorganisms.

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2 Soil Scientist and Agronomist, respectively.
3 Figures in parentheses refer to "Literature Cited", p. 164.