DEPRESSIVE INFLUENCE OF CERTAIN HIGHER PLANTS ON THE ACCUMULATION OF NITRATES IN SOIL

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A partial review of published experiments which appeared to have a bearing on this subject was compiled by two of the present writers in 1913 (4). In this review, results were grouped under two headings: (a) experiments showing higher nitrate content under plants than in fallow land, (b) experiments indicating a depressed nitrate formation under plants. It is significant that the soils in which it was found that the nitrate content under living plants was higher than in similar soil under fallow were all made during the earlier stages of growth of the plants and that the analyses that indicated a depressed nitrate formation were all made at a later stage or at maturity.

A short time afterwards Russell (7) reported some experiments on this subject and also reviewed some of the literature. His own experiments, and most of those which he cited, indicated only a depressed nitrate formation in soil bearing plants. It should be noted that with the exception of those which did not indicate a depression of nitrate formation by the crop all of the analyses reported by Russell were made when the plants had reached maturity.

Russell cited an investigation by Warington (9) who found an apparent disappearance of nitrate nitrogen on cropped land. Warington suggested that the crop may have taken up this nitrogen and afterwards lost it, presumably to the air. Russell, however, holds that the disappearance of nitrate nitrogen in the cropped soil is more properly to be attributed to diminished production and further that the diminished production is not to be traced to the effect of the crop on the temperature or moisture content of the soil.

Beside the theory advanced by Warington to account for the disappearance of nitrates in soil accompanying the growth of plants, one has been proposed by Dehérain (1) to the effect that the growing plant by removing moisture from the soil

1 Contribution from the Department of Agronomy, Cornell University, Ithaca, N. Y. Received for publication September 25, 1923.
2 Professor, Professor, and Assistant Professor of Soil Technology, respectively.
3 Reference by number is to "Literature Cited," p. 467.