THE EFFECT OF CERTAIN HERBICIDES ON SOIL MICROORGANISMS

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The use of herbicides is assuming larger proportions as the need for them becomes more pressing and as the effectiveness of the treatments is increased. The introduction of new inorganic and organic compounds for controlling certain weeds has caught the fancy of the public and no doubt will lead to a greater use of these and others yet to be promoted.

Probably the best known herbicide is sodium chlorate. Although this is a good weedkiller, it has the disadvantage of rendering the soil toxic for desirable plants. Much work has been done with it, some of which is contradictory.

It was during the experiments of Hurd-Karrer (3, 4) that our attention was called to the fact that soil reaction and nitrates were factors in the reduction of the residual toxicity of sodium chlorate. It was postulated that soil microorganisms might be involved. Consequently, samples were taken from soil in greenhouse benches which Hurd-Karrer had treated with various herbicides and bacteriological analysis made. These consisted of making plate counts of total viable organisms, fungi, and actinomycetes and the determination of the numbers of protozoa by the ultimate dilution method.

In spite of the fact that no consistent results were obtained from the samples, the idea that microbes might be involved in the reduction of the toxicity still persisted. About that time Nelson (8) observed that the numbers of ordinary soil organisms (heterotrophs) were not affected by the chlorate, that their activity in treated soil was increased by the addition of organic matter, and that this caused a rapid reduction of the chlorate. Although Nelson's method of determining microbial activity is open to criticism because of the anaerobic condition of the experiments. Under which gas was produced from glucose, his former can be seen in spite of this difficulty. It is sometimes difficult to distinguish between small actinomycete and bacterial colonies, but any great change in cation. It is sometimes difficult to distinguish between small actinomycete and bacterial colonies, but any great change in cation. 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