Lead Arsenate for the Control of Crabgrass

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UNDER some conditions lead arsenate, if properly applied, is an excellent control for crabgrass in lawns. The much publicized new weed control material 2,4-dichlorophenoxyacetic acid does not kill either the large crabgrass, Syntherisma sanguinale, or the small crabgrass, S. ischaemum. Crabgrass, therefore, remains the No. 1 problem in many lawns and in other areas of fine turf.

Some years ago it was found (7) that 95% or more of the crabgrass in the lawn at the Ohio Agricultural Experiment Station was killed if lead arsenate was applied at the rate of 20 pounds per 1,000 square feet, providing the work was done during the fall or winter months previous to the first of March. Similarly, favorable results were obtained elsewhere in the United States, but in other localities failures were reported. In an effort to find the cause for this variation in performance, a research project was inaugurated the object of which was to determine why the results had been unpredictable.

HOW LEAD ARSENATE CONTROLS

The first step was to determine the manner in which lead arsenate controls crabgrass in those areas where favorable results had been obtained. A logical beginning in the research program, it was thought, would be to determine first, the active agent of control in the lead arsenate, whether the anion or the cation; and second, whether it killed the seedlings or the embryo of the seed.

Anion or cation.—To determine whether the anion or cation is responsible for the control, lawn areas badly infested with crabgrass on the campus of the Ohio Agricultural Experiment Station (Wooster silt loam) were treated with various salts each containing one or the other radicle but not both. The chemicals used were calcium arsenate, manganese arsenate, arsenic pentoxide, and lead acetate. The latter gave no control, but all of the others did and inasmuch as the acid radicle is the only property they have in common it follows that the anion in lead arsenate is the active agent.

Seedling or seed.—To determine how the lead arsenate controls, that is, whether it kills the tiny crabgrass seedlings or the seed itself, it was applied to a new seeding of crabgrass—made in midsummer when both moisture and temperature conditions were favorable for prompt germination of seed. In this test little or no control was obtained, thus indicating that the arsenate does not act on the seedlings. Since crabgrass seed germinates promptly under favorable conditions, it is conceivable that the seedlings may have become established before any breakdown occurred in the lead arsenate.

In another test turf badly infested with crabgrass seed was treated

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3Figures in parenthesis refer to "Literature Cited", p. 520.