

Leach Debates Doubter of Arsenate of Lead

B. R. LEACH'S series of articles in GOLFDOM on Grub Control have stirred up lively national interest. One of the responses to Mr. Leach's comes to us from an eastern source, under the heading, "Arsenate of Lead—A Cure-All or Kill-All for Greens?"

The one who questions the Leach conclusions writes:

Doubts Arsenate of Lead

"Someone has recently spoken of arsenate of lead as the nearest thing to a "cure-all" for turf troubles. Early experiments might seem to confirm this statement, but careful analysis, taking all factors into consideration would indicate that in the end it is more apt to prove a "kill-all," and this applies to the turf as well as to the grubs and bugs.

There are several very important reasons why arsenate of lead would be dangerous to use on greens. In the first place the idea of poisoning the soil is fundamentally wrong. We cannot mix poison with our food without a harmful result, and likewise we should not mix a powerful poison with plant food. Arsenate of lead is made from arsenic and lead, and arsenic is known to be the most deadly poison to vegetation. Arsenate of lead is apparently insoluble in water, but the action of the elements, the chemicals in the soil and the chemical added to the soil in the form of fertilizers, will in time break down the arsenate of lead and thus make it soluble and poisonous to the turf. This may be a slow process, but when it does take place, it will do the turf a great deal more harm than good.

Arsenate of lead will do away with grubs, and there is no question about the advisability of killing and permanently eliminating grubs, because they do a great deal of damage and serve no vital purpose in the soil. Unfortunately however, arsenate of lead will also eliminate all other forms of life in the soil, and what is going to happen to the soil if all life in it is done away with permanently? There is only one answer, and that is that the soil itself will become dead. Bacteria, insects and worms

are needed in the soil for very definite purposes.

Importance of Worms

Consider for a moment the important work that the worms perform in the soil. They are constantly burrowing through the soil in all directions, thus keeping the soil light and aerated so that the vegetation secures nourishment and grows easily. This lightening of the soil by the worms also causes better drainage.

To be sure they may be a nuisance on the greens during certain months when they become too numerous and too active, but they are troublesome only for a few months whereas they are performing a very necessary work the other months. When they become too numerous and troublesome, they can easily be removed by preparations known as worm eradicators, and without injuring the turf or poisoning the soil.

Arsenate of lead on the other hand would not only kill the worms in the green but in fact would permanently eliminate them, for worms could not exist in soil with this poison present. The result would be that without the worms the soil would gradually pack down and become very hard, and would furnish very little nourishment to the turf. Proper drainage would not take place, and the green would soon become very sick. It might take three or four years, before the grass would actually start to die, but the chances are that the use of arsenate of lead would necessitate completely rebuilding the greens within five years.

Can you afford to take such chances with your greens?"

The answer made by Mr. Leach, referring to his extensive experiments with arsenate of lead, follows:

Leach's Reply

"The above epistle is interesting especially so because it puts in black and white the attitude as regards arsenate of lead in fine turf which I am satisfied exist in the subconscious minds of more than one individual at this time. However the above remarks can be considered only of value as the personal

opinion of the above writer and not as a proof that arsenate of lead is a "kill-all" in fine turf. He presents no technical data or other substantiation of his stand on arsenate of lead.

I realize that the very thought of adding arsenate of lead to soil outrages all the theories and sacred ideas of the old school who consider such an action only as the violation of all so-called natural laws. I can remember not many years ago when the spraying of fruit and shade trees with arsenate of lead first came into vogue. All the wise men designated it as a "kill-all" and tried to get legislatures to make such spraying illegal. It would kill the trees, and would kill the persons who did the spraying, etc., etc., ad infinitum, but please take note that they are still spraying trees with arsenate of lead and will continue no doubt to do so until a better and easier method is found.

All new methods, inventions and innovations have to undergo this barrage of criticism but if they are sound they emerge unscathed and ultimately become an accepted, taken for granted part of our daily lives. So in the same way, I am entirely satisfied that the use of arsenate of lead in fine turf will be given a thorough trial by turf enthusiasts all over the world, and, if it is as sound a method as my six years of experimental work lead me to believe, it will take its proper place in the accepted system of turf maintenance.

I do not intend to take the space here to refute the argument for arsenate of lead as a "kill-all" because the value of arsenate of lead in fine turf is now under discussion by myself in a series of articles appearing in GOLFDOM. I would however suggest that the gentleman do a little bit of studying in elementary toxicology, plant physiology and the chemistry, physics, and biology of soils. It would certainly help him to form a revision of opinion on the interaction of arsenate of lead, soil and turf grasses.

Soil Action

The action of soil upon arsenate of lead is not a slow or long delayed process, in fact it begins at once and continues for some time before a chemical equilibrium is set up between the soil

and the arsenate. At the end of this time some of the arsenate of lead has broken down forming basic arsenate of lead which is virtually insoluble in the soil solution and is non-toxic to grubs, worms and vegetation. Soluble arsenate in the form of arsenates or arsenites is also formed, this being toxic to the majority of weeds, to grubs and worms, but non-toxic to the majority of fine turf grasses. The remainder of the arsenate of lead originally added to the soil stays in the soil chemically unchanged for long periods of time, years in fact, and does not influence plant growth one way or the other. It simply acts as a grub or worm poison. Therefore if the grass is to die, or the soil to become barren, as a result of the application of arsenate of lead it should take place within a few weeks and not 5 years later as the gentleman, contends. I have turf at River-ton which has been arsenated for 6 years. It is still in first-class condition.

If arsenate of lead did not break down in soil until 2, 3, or 5 years had passed it would be valueless as a weed control agent because it is the soluble arsenate so formed which acts in this capacity. If arsenate of lead were so stable that it did not break down in soil it would be valueless as a worm and grub poison because it would then be too stable chemically to break down in the stomach of the worm or grub and would fail to liberate the soluble arsenic which poisons.

As far as earthworms are concerned you may have and welcome. I don't want them neither do I want anything else on a golf green which interferes with true and sure putting.

Worthington Mower in New Chicago Office

WORTHINGTON MOWER CO. now is occupying its new Chicago office at 517-21 South Laflin street. There is approximately 50 per cent greater space in the new office and warehouse than the company had previously in Chicago.

WINTER-KILL usually means the soil is water-logged. Remember this when you are making your spring check-up on the course's condition.