

BOOK REVIEW.

THE USE OF CARBON BISULPHIDE AGAINST THE WHITE GRUB. By W. H. W. Komp. Soil Science, Vol. X, No. 1, pp. 15-28. Miscellaneous Soil Insecticide Tests by J. J. Davis, Soil Science, Vol. X, No. 1, pp. 61-72, pls. 1, 2, 1920.

The above two papers, which are of entomological interest, have recently appeared in Soil Science, a journal devoted to soil physics, soil chemistry and soil biology. While they are clearly within the field of soil biology, it is doubtful if they will reach the eyes of many entomological readers and, for such a reason, it was thought advisable to prepare this brief notice. Mr. Komp's paper deals with the determinations of the maximum dosage of carbon bisulphide non-injurious to such plants as blue-grass and clover, the minimum dosage fatal to the grub, and the influence of temperature and moisture conditions upon the effectiveness of the fumigation. Presumably, *Lachnosterna* larvæ were used. A detailed account of the experiments is given together with tables showing air and soil temperatures, dosages, effect of carbon bisulphide on plants and percentages of grub mortality, using different dosages at different depths and distances in the soil. Mr. Komp concludes that the maximum dosage for ordinary lawn and golf-grasses appears to lie somewhere between 1 and 5 ounces per square foot and considerably above the former, while the minimum dosage for the white grub is about 1 ounce, also that temperature exerts a decided influence on the minimum dosage for the white grub (1 oz. at 65 degrees F. and less than 1 oz. at 85 degrees or above). The injections should not be much over six inches apart. The soil moisture must be medium (10%) to wet (20%) for good results. In addition the charge of carbon bisulphide should be placed several inches below the point where the grubs are working. A limiting factor in the use of carbon bisulphide against the white grub in situations in which it cannot be reached by cultural methods is its relatively high cost. According to the tables in Mr. Komp's paper, the number of larvæ used in a single experiment varied from 2 to 4, and the mortality figures or percentages are based on these numbers. These appear to be far too small to insure any degree of certainty in the results.

The second paper by Mr. Davis reviews briefly the results obtained by various workers using such soil insecticides as carbon bisulphide, sodium cyanide, potassium cyanide, hydrocyanic acid, calcium cyanamide and kerosene emulsion against various soil infesting insects. In addition, he gives the results of his own field tests with such materials as kerosene emulsion, creosote preparations, corrosive sublimate, sulphuric acid, acetaldehyde, Kopper's solution, and especially sodium cyanide against the grubs of *Popilia japonica*. Tables are presented showing rates of application per acre, areas treated, areas examined, dates of treatment and percentages of mortality. After summarizing the present knowledge of the effect of treatments of cyanide and of cyanide in combination with ammonium sulphate on soil, Mr. Davis concludes that while many isolated experiments have been made to determine the possible use of sodium cyanide as a soil insecticide, the entire study lacks continuity, and that until a consistent and continuous program of work is inaugurated, very little in the way of definite results can be expected.

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