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Report 1918-20 With the Supplement to the Guide to the Experimental Plots Containing the Yields per Acre Etc.



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Entomological Investigations

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ometer apparatus—the gift of Robert Mond, Esq.—is now being set up, and the sources of error eliminated preparatory to a general investigation of the nature of soil acidity.

Many farms in the country are short of lime, but agricultural advisers are often in the difficulty that they cannot tell a farmer exactly how much lime the soil needs: often, indeed, they can only say that he should apply between 10 cwts. and 2 tons per acre. Of course, if farming were independent of cost, this vagueness would not matter, but the delicate financial balance under which agriculture has to be conducted leaves no margin for indecision between 10 cwts. and 2 tons. It is hoped that one result of these investigations will be to enable experts to give more definite advice than is now possible.

During the period under review, two voluntary workers have assisted in the work of the department—Mr. V. A. Tamhane, Soil Physicist to the Bombay Presidency, and Mr. H. Raczkowski, of the Palestine Experimental Station.

SPECIAL ENTOMOLOGICAL INVESTIGATIONS.

In addition to the important investigations on the insect and other invertebrate fauna of the soil already dealt with on p. 20, the Entomological Laboratory has undertaken the following work:—

(1) A study of the biological phenomena of Aphides. The results are set out on p. 49.

(2) *Chemotropism*. Dr. A. D. Imms, in conjunction with Mr. H. M. Morris, has extended his previous work (p. 48) on the responses of insects to chemical stimuli. This property opens up the possibility of controlling certain injurious insects which cannot satisfactorily be dealt with by insecticides. The method of experiment is to expose uniform amounts of various chemical substances in a series of traps for a constant length of time and to identify the species and the sex of the insects that respond.

(3) Wireworm investigations have been carried out by Mr. A. W. Rymer Roberts on the biological side, and in conjunction with Mr. Tattersfield on the chemical side (p. 43).

(4) In view of the urgent necessity for systematising the subject, Dr. A. D. Imms is preparing an advanced text book of entomology for the use of research students, which it is hoped to complete during the present year. A beginning has also been made towards the formation of insect collections which will be essential for purposes of identification and research.

(5) *Insecticides*. By common consent the subject of insecticides is not well advanced, and efforts will be made to obtain much needed fundamental knowledge. On the chemical side, Messrs. Tattersfield and Roach have investigated Tuba root (*Derris elliptica*) from which they have extracted two crystalline substances, some resins, an oil and an amorphous substance, apparently a saponin. Of these the resins and one crystalline substance are toxic. Methods have been devised for comparing the toxicities of these products, and also of different consignments of the root. In addition a chemical method for evaluating the root has been elaborated.