

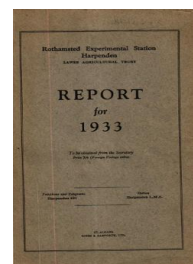
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ROTHAMSTED  
RESEARCH

## Report for 1933

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## Bees

### Rothamsted Research

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### INSECTICIDES

The work has been chiefly concerned with insecticide plants. Those containing rotenone and the pyrethrins are most valuable because, although highly poisonous to insects, they are comparatively harmless to human beings and domestic animals. Curiously enough, rotenone is highly poisonous to fishes also. There is an increasing demand for this substance which, so far, cannot be made synthetically on the large scale; it therefore has to be extracted from plants.

Pyrethrum (*Chrysanthemum cinerariaefolium*) is a valuable insecticide, its flowers containing two important active principles—the pyrethrins I and II. Experiments are made in collaboration with the Plant Pathological Department of the Ministry of Agriculture to ascertain the effect of soil, season, manuring and other cultural operations on the yield of pyrethrin per plant and per unit area. The plant is perennial in habit, but requires a period of dormancy otherwise it gives poor yields of flowers; generally speaking the climatic conditions of this country appear to suit it better than those of tropical countries. The possibility of obtaining by cross-fertilisation new and more potent strains than the old ones is being examined.

Unfortunately, pyrethrum dusts quickly lose their efficacy when exposed to air and light. Methods have now been devised for partially overcoming this.

Two groups of tropical plants, *Derris* spp. and *Lonchocarpus* spp., contain rotenone as well as other insecticidal substances, and are included in the investigations. Some of this work is done in association with the East Malling Research Station and with the Department of Agriculture of the Federated Malay States: it is clear that Malay can produce excellent samples.

The increasing demand for rotenone and similar insecticides and the fact that the British Empire can supply the necessary plant materials either from the tropical or the temperate regions makes it very desirable that this work should be developed much more intensively than is being done at present. F. Tattersfield has struck a very valuable line of work and his results are being closely watched by insecticide makers at home and in the United States. With more assistance he could make much more rapid progress than is possible at present. Messrs. Geo. Monro kindly provide funds for a technical assistant, while a substantial subscription has recently come from the well-known firm of Messrs. S. B. Penick & Co., of New York. The Department is still understaffed and could work to much greater advantage if more funds were available.

### BEEES

The useful investigations carried out by D. M. T. Morland over the last eleven years on the technique of honey production are now bearing fruit, and his services are increasingly in demand among bee-keepers. Considerably more work has been done this year on the factors determining the rate of accumulation of honey in the hive, as measured by continuous weighing, and on internal economy of the hive, studied by closely watching the activities of marked bees in a glass hive. New and interesting observations are being made which

are giving much valuable information about honey production, swarming, and other subjects of great importance to bee-keepers.

Hitherto no work has been done on bee diseases, but at the urgent request of a large number of bee-keepers these are now to be included in the programme. The bee-keepers have expressed their interest by the very convincing method of subscribing through the British Bee-Keepers' Association the sum of £250 a year for three years towards the cost of the work. The Agricultural Research Council, impressed by this keenness, have granted an equal amount, so that a bacteriologist has now been appointed to study the Foul Brood Diseases. H. L. Tarr, of the Universities of British Columbia, Montreal and Cambridge, commenced work on May 1st, 1934. The Rothamsted authorities have, on their part, provided a good-sized laboratory exclusively for Bee investigations. It is hoped that further support will be forthcoming, so that the laboratory may be fully used for the working out of the highly important and extremely fascinating problems associated with bees.

#### THE STATISTICAL DEPARTMENT

With the departure of R. A. Fisher to take up his new duties on October 1st, 1933, as Galton Professor of the University of London, the Department enters on a new phase of its existence. Professor Fisher's work at Rothamsted has revolutionised the science of statistics and the technique of biological experimentation, and agriculture must consider itself indeed fortunate to have had his especial attention for so long. His own account of his work is given below. It is with great pleasure that we are able to record that he has consented to remain an honorary member of the staff in a consultant capacity.

With the improvement in the quality of agricultural experimentation, and the spread of the new methods, the demands on the Department for analytical and advisory work are continually increasing. Mr. Yates, who succeeds Professor Fisher as Head of the Department, while following the lines laid down by his predecessor, is endeavouring to expand the agricultural side of the Department's activities so as to make the new methods available to stations which are still working on the old lines and in problems where they have not yet been applied. The technique of Animal Husbandry experimentation, for example, is far behind that of field crops; and many stations both in this country and overseas feel the need of some central statistical advisory department to which they can turn for advice on the layout of experiments and the interpretation of results; some, indeed, would appreciate the services of a computing office which could take the heavier part of the arithmetical work off their shoulders.

It would be impracticable and unnecessarily costly to urge that each Agricultural Institution or Department doing experimental work should have a trained Statistical Staff, though the larger ones certainly should be so equipped. The Department at Rothamsted has since its inception devoted considerable time to helping experimenters from other institutions. It has received a constant stream of workers from all over the world, often bringing with them their own data, and spending weeks, or months, in applying the new methods to them, or in discovering how to apply them to new problems.