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[Full Table of Content](#)



Bee Department

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BEE DEPARTMENT

By C. G. BUTLER

GENERAL

Both the research and the advisory work of the Department were continued throughout the year. Besides dealing with many enquiries about colony management and the pollination of fruit and seed crops, 1,855 samples of brood and 1,077 samples of adult bees were examined for disease, the results shown in Tables I and II below being obtained.

Various members of the Department gave a number of lectures to Beekeepers' Associations and other organisations, and in addition served on various committees such as the Minister's Bee Disease Advisory Committee, the British Standards Institute Sub-Committee for the standardisation of beekeeping equipment, and the British Beekeepers Association Research Committee.

One member of the Department, Dr. C. G. Butler, toured the U.S.A. and Canada for a few weeks in the spring of 1946 visiting Bee Research Centres, Commercial Beekeepers, and others. A brief account of his visit has been published (113).

Table I.—Brood disease diagnosis, 1st October, 1945—30th September, 1946 (England and Wales)

<i>Disease</i>	<i>No. of samples</i>
American Foul Brood (A.F.B.)	1,191
European Foul Brood (E.F.B.)	66
A.F.B.+E.F.B.	0
A.F.B.+Chalk Brood	0
E.F.B.+Chalk Brood	0
Chalk Brood	40
Stone Brood*	1
Addled Brood	48
Chilled, Starved, Neglected Brood	28
No evidence of disease or of abnormal brood; nature of complaint undetermined	481
Total	1,855

* It is of interest to note that this is so far as is known the first case of Stone Brood ever to be definitely diagnosed at Rothamsted.

Table II.—Adult bee disease diagnosis, 1st October, 1945—30th September, 1946 (England and Wales)

<i>Disease</i>	<i>No. of samples</i>
Acarine	224
Nosema	16
Amoeba	4
Nosema+Amoeba	0
Paralysis (various types)	253
Arsenical poisoning	3
No evidence of disease or abnormal condition	577
Total	1,077

RESEARCH WORK

American Foul Brood

Following preliminary experiments in 1944 and 1945 a memorandum on the sulphonamide treatment for American Foul Brood was prepared for the Minister's Bee Disease Advisory Committee. Tests of the treatment on naturally occurring cases of the disease as proposed in the memorandum were carried out at ten selected outside centres during 1946 in collaboration with county beekeeping instructors and bee disease officers. Two of the thirty-two colonies involved in these trials failed to respond satisfactorily to the treatment; one colony reported to be healthy following treatment showed a recurrence of the disease six weeks later; the remaining colonies were all reported to be free from visible signs of disease at the end of the season. Free sulphonamide was found in samples of honey taken from all those colonies which gathered a surplus for extraction whilst treatment was in progress. A detailed report on these trials has been prepared for publication (114). Further trials of the sulphonamide treatment on artificially infected colonies in the Rothamsted Disease Apiary were also carried out. Further trials are planned for the 1947 season.

European Foul Brood

Experiments with sulphonamides against European Foul Brood carried out at Rothamsted on colonies suffering from this disease have given either negative or indefinite results which could not be distinguished from the spontaneous disappearance of this disease which frequently occurs during the course of the season.

A considerable amount of work remains to be done on this disease which appears to be largely confined to certain "E.F.B. Areas" in this country and which appears to be greatly influenced by the balance between bees, brood and stores in the colonies concerned.

Nosema

Tests of the sulphonamides used for the treatment of Foul Brood on bees kept in cages in the laboratory and infected with viable *Nosema* spores gave negative results in every case.

Pollination

Work has been continued in an endeavour to determine the relative value of honeybees and other insects for the pollination of specific crops. It was found again during 1946 that in the Harpenden district honeybees were responsible for the pollination of the greater part of the red clover seed crop.

Development of a technique to cause honeybees to visit and pollinate the flowers of a predetermined crop such as red clover has been continued. Promising results have been obtained in small scale experiments but it is now clear that further work on the behaviour of bees when seeking nectar and pollen in the field and upon the division of labour amongst bees of foraging age will be necessary before full advantage can be taken of this technique. Recent work by von Frisch suggests that bees can not only indicate to one another the floral source of a particular nectar (or pollen) but also the approximate direction in which the source lies relative

to the hive and the distance of the source from the latter. This work, if confirmed by experiments planned for 1947, will clearly have considerable bearing upon the conditioning of bees to visit the flowers of a particular crop for purposes of pollination, and may very well lead to more positive and accurate results being obtained in the field in the future. This line of work clearly is full of promise and may lead in a few years to the elaboration of a technique by means of which seed growers will, given suitable weather conditions during the flowering period, be able to ensure a full set of seed of such crops as Red Clovers, White Clovers, Sainfoin, Lucerne, etc.

Studies of the kinds and amounts of pollens collected by honeybees have been continued. It was found that during 1946 each of two colonies of bees in the Home Apiary collected about 12lb. of pollen composed of loads from about 130 different species of plants, but 95 per cent. of all this pollen came from about 20 plant species of which the clovers alone yielded almost 50 per cent. It was further found that such forest trees as Ash, Birch and Oak, which have hitherto been considered doubtful sources of pollen for honeybees, are of considerable importance. A paper on this subject has been prepared (115).

Poisoning by D.D.T. and Gammexane

Work on the possible dangers of sprays and dusts containing D.D.T. and Gammexane to honeybees and other valuable pollinating insects has been completed in collaboration with members of the Insecticide Department. The results show that even when sprays and dusts containing D.D.T. are applied to open blossom the damage to honeybees, bumblebees and species of *Andrena* is negligible, nor is any apparent damage caused to their larvae. Gammexane on the other hand is extremely toxic to all these beneficial insects, and if applied to open blossom in the field may lead to serious consequences. A paper on this subject is being prepared.

The feeding of bees

The series of comparative trials of methods of feeding bees in autumn, winter and spring, and on colony development in spring, carried on each season since 1939 have now been concluded and a paper giving the results published (111). It has been shown that no benefit results from either winter or spring feeding if the colonies are provided with adequate stores of food in the autumn.

Electrical heating of beehives

Further studies on the possible beneficial effects of electrical heating of beehives, using an improved type of frame-heater designed by Mr. E. B. Wedmore, have been carried out in collaboration with the Electrical Research Association. No beneficial results were obtained at any of the intensities of heat employed (112).

Publications (including Summaries), page 111.