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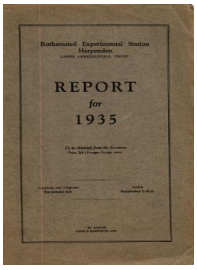
Report for 1935

Full Table of Content



Entomology

Rothamsted Research

Rothamsted Research (1936) *Entomology ;* Report For 1935, pp 58 - 58 **- DOI: https://doi.org/10.23637/ERADOC-1-67**

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ENTOMOLOGY

The Entomological Department is concentrating on a study of the factors that determine the changes in number and the movements of insect populations. Observations show that all the ordinary harmful insects occur on our farm but in general their numbers are so small that they do little damage. Occasionally, however, one or more species multiplies with extraordinary rapidity and devastates the crop. The spring of 1935, for example, was not favourable for insects in general, yet one species, the Pygmy Mangold Beetle, multiplied so inordinately that it completely ruined the mangolds on Barnfield, on which mangolds have been grown every year since 1876 (with two exceptions) and where the insect has certainly been living for a long time. In certain investigations, the general procedure is to take systematically frequent " samples " of the insect population of the farm. Methods have been devised for making sample censuses that can be subjected to statistical examination and these are continuously improved to facilitate their use in practice. Approximately four times as many insects were caught from March to October in 1935 as in the corresponding period of the previous years, the difference being mainly in the Lepidoptera and the Diptera. Full meteorological observations are taken, and relations are sought between these and the census figures. The numbers of nocturnal insects caught in a light trap show a definite lunar periodicity, with low numbers at full moon and high numbers at new moon. The effect is more marked for some groups of insects than for others and is most significant in the *Noctuidae*.

A higher proportion of females was obtained in the *Noctuidae* in a trap at a height of 35 feet above the ground, than in one about 3-4 feet above the ground.

A mechanical trap for insects, designed and tested during the year has been found valuable for estimating the activity of small slow-flying insects, such as green fly. It has already been adopted for use in studying the transmission of potato virus disease by insects.

Dr. Barnes has completed the first series of his studies on variation in population of certain insects, which include nine years' observations in the case of the wheat midges. The figures for 1935 for the latter insect show an increase over the previous two years and so fit very closely to the periodic curve which was suggested three years ago.

The analysis of records of insect migration has thrown light on two important problems. Considerable evidence has been found that some British migrant butterflies and moths make a return flight to the south in the autumn, also that one of the migrant Hawk moths which occurs in both Europe and America, at times as a pest, shows a tendency to occur simultaneously in both Continents. This indicates that the causes of migration in this species must be sought for in factors that are either very widely spread or are positively correlated in the two Continents.

INSECTICIDES.

Dr. Tattersfield and Dr. Martin investigate the direct attack on harmful insects by means of insecticides. Certain vegetable