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ROTHAMSTED
RESEARCH

Rothamsted Report for 1932

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Insecticides

Rothamsted Research

Rothamsted Research (1933) *Insecticides* ; Rothamsted Report For 1932, pp 49 - 50 - DOI: <https://doi.org/10.23637/ERADOC-1-64>

Dr. Barnes. Mr. Newton is endeavouring to find what difference in the willow accounts for the difference in attractiveness to the midge.

Dr. Margot Metcalfe completed her studies on the red clover, cocksfoot and ryegrass gall midges, and worked out the biology of three gall midges found on Park Grass plots, two being new to science. She now has a Commonwealth Research Fellowship tenable at the Carnegie Institute and Johns Hopkins University.

BEE RESEARCH

Further work has been done on the recording of the daily life of the hive. The observations with marked bees have continued, and the results agree closely with those set out in last year's reports. Two more continuous weighing devices have been installed to record the mass movements of the bees by recording the changes in weight of the hive, and some interesting relations have been found between hours of sunshine and hours of nectar gathering. Search is being made for some method of recording the entrances and exits of bees to and from the hive.

A vigorous effort is being made to find the funds for a bacteriologist to study the Foul Brood diseases which are now causing great losses to beekeepers.

INSECTICIDES

Dr. Tattersfield and his staff continue their studies of plant products poisonous to insects: these have the advantage that they are safer in use than mineral poisons, being relatively harmless to human beings and domesticated animals.

Pyrethrum is one of the most interesting in that it can be grown in this country and its manurial requirements seem to be very low: it will indeed grow on poor sandy soils, but whether it would be economically advantageous as a crop is not yet known.

Culture experiments have been made by Dr. Martin to find the effects of temperature, dormancy and degree of illumination on the growth of the plant. By varying these conditions it was possible to obtain a short harvesting period, such as is usual in this country, or a long harvesting period, such as is usual on the Kenya uplands, or a complete absence of flowering, as is characteristic of tropical lowlands Trinidad, Uganda and elsewhere.

Further work has been done on the loss of virulence of pyrethrum dusts on exposure to air and light. This has already been traced by Dr. Tattersfield to oxidation and he has shown that it can be retarded in pyrethrum-talc dusts by an admixture of antioxidants. He finds, however, that the effect of pyrethrum extracts upon the insect is not materially increased by the addition of an antioxidant. The effect of light upon pyrethrum dusts is being studied; it is found that as the activity declines, the yellow colour of the dusts fades and the question arises whether the pigment protects the poison.

The fish poison plants from the tropics have been further investigated. The rotenone content is still the best measure of toxicity but further tests with insects are being made. The problem is very important because some samples of these plants are almost devoid of insecticidal power, e.g., one sample of *Derris elliptica* contained no rotenone and was harmless to insects; some cultivated

samples of *Lonchocarpus* were much poorer than certain wild samples.

The biological tests require large supplies of insects raised under standard conditions, and last year H. C. F. Newton after various trials worked out the technique for producing cultures of *Myzus persicae* Sulg. in the necessary quantity, both the insect and its host plant, the dock (*Rumex obtusifolius*) being easy to grow.

INSECT PESTS AT ROTHAMSTED AND WOBURN, 1931-32
H. C. F. NEWTON

GENERAL. In the winter unusually severe damage to cereals was caused by slugs, chiefly the Grey Field Slug *Agrolimax agrestis* L. The wheat experiment on Fosters suffered badly, doubtless due to the encouragement of the slugs by the surrounding ley. Partial failure of wheat after ley appears to have been general especially in Norfolk though damage appears to be more severe after ley mixtures containing rye grass. It is therefore possible that frit fly attack is responsible for some of the loss (cf. last year's report) yet on one field examined at midnight scarcely a plant was without its attendant slug.

BROADBALK. *Wheat*. It is interesting to note that these observations indicate no increase in insect damage on this field, as compared with rotation wheat fields, in spite of the continuous cropping with the same plant. In fact, during the last two years the greatest loss of wheat plant has been on the rotation series. Similarly the permanent mangold field, Barnfield, suffered no loss from *Atomaria linearis* the Pigmy mangold beetle this year, though the severity of attack by this insect is supposed to be greatly increased by a sequence of mangold crops. It would seem therefore that the other factors controlling insect increase completely swamp any effect due to continuous cropping.

Frit Fly (*Oscinella frit* L.). No winter attack by this insect occurred this year.

The Wheat Bulb Fly (*Hylemyia coarctata* Fall.) attack was slight, as was also that of the Wheat Leaf-Miner. The latter insect was bred from material collected last year and identified by Mr. J. E. Collin as *Agromyza (Domomyza) ambigua* Fall. In addition, the following parasites have been bred out: the two Braconids *Dacnusa leptogaster* Hal., *Opius maculipes* Wesm. and a Chalcid *Lamprotatus gibbus* Walk.

Wheat Midge (*Contarinia tritici* Kirby, *Sitodiplosis mosellana* Géhin), attack though still high was slightly less than last year; the parasitism was still high. The figures for the last six years are:

Year	..	..	..	1927	1928	1929	1930	1931	1932
Percentage of damage to grain	..	..	..	3.2	6.5	7.7	17.6	21.4	15.4

GREAT HOOS FIELD. *Barley*. The Grey Field Slug (*Agrolimax agrestis* L.) caused some damage during the winter months. Wireworm, *Agriotes* spp. was again present causing some gaps but less damage was done than last year. Gout fly *Chlorops taeniopus* Meig. was again less prevalent than in 1929-30.

LONG HOOS. SIX COURSE ROTATION. *Sugar Beet*. An attack of wireworm beginning when the plants were in the cotyledon stage