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THE DEVELOPMENT OF INSECTICIDAL BAITS

FOR THE CONTROL OF PORINA (Wiseana Spp.)

A thesis

submitted in the partial fulfilment of the

requirements for the Degree of

Master of Science in Zoology

at Massey University

by

Neville Alexander Haack

Massey University

1982
Porina (*Wiseana* spp) damage in the field (left) and a porina caterpillar in its subterranean burrow (right).
ABSTRACT

Investigations in the development of chipped wheat baits for porina control were carried out in the laboratory and the field. In the laboratory porina readily accepted untreated chipped wheat in the presence of white clover (Trifolium repens L.) or perennial ryegrass (Lolium perenne L.). They also accepted equally, three different sizes of wheat baits, and fed at temperatures between -2°C and 25°C. Porina accepted insecticidally treated baits in the presence of untreated wheat or white clover, however did not readily accept fungus (Metarrhizium anisopliae (Metsch.) Sorok.), infected wheat in the presence of the latter two foods. Baits were removed by porina from around their burrow mouths when applied to the surface of turfs held under controlled conditions. The number of baits removed per active porina was related to the density applied.

Field trials demonstrated that insecticidally treated baits, of the smallest size (528 chips/g. dry weight), being the most cost-efficient, gave comparable mortalities to conventional spray applications. After 10 days fenitrothion spray (0.9 Kg ai/ha) gave 95% control of porina populations, and with fenitrothion treated baits (0.13 Kg ai/ha) applied at 1 chip/6.25 cm² the control achieved was 83%. At a lower bait density (1 chip/25 cm²) a significant increase in mortality was seen between 10 and 30 days. The addition of a molluscicide onto a treated bait increased its efficiency by 10%. Applying baits infected with the fungus Metarrhizium resulted in 53% mortality of porina.

The optimal bait density was shown to be one wheat chip/12.5 cm², and the optimal dosage of fenitrothion 0.4% ai/g. dry weight of wheat. The cost of bait treatment, including application costs, for porina control was $15/ha, compared to $46/ha for spraying.
ACKNOWLEDGEMENTS

I wish to thank my Supervisor, Professor B. P. Springett, of the Botany and Zoology Department, Massey University, for his diligent advice and encouragement, and for the correction of the manuscript. The use of departmental facilities, office space, and technical advice was appreciated.

I also acknowledge the expert guidance and encouragement received from Dr W. M. Kain and his research team of the Ministry of Agriculture and Fisheries (MAF), Palmerston North. Dr Kain’s original ideas instigated the conception of this joint venture Thesis; and the use of facilities and equipment belonging to the Ministry was invaluable throughout these studies.

Appreciation is expressed to Dr G. C. M. Latch of the Department of Scientific and Industrial Research (DSIR) Palmerston North, who supplied cultures of Metarrhizium anisopliae, and to the people from the MAF/DSIR/Massey University research campus who gave useful advice and permitted the use of their equipment. Special thanks is given to Mr Ted Roberts, Agronomy Dept., for his concise advice before these studies began.

The use of field trial sites, and wool-shed accommodation at Mr Geoff Thompson’s property was appreciated, as well as the genial co-operation of his farm manager, Mr Ken Murdie. Mr Alan Carpenter, MAF, kindly introduced me to these people.

Finally special thanks must go to the people who helped with encouragement during the collation of results and the writing of this Thesis which, at times lost momentum. The presentation by the author, of a paper on aspects of these studies at the Third Australasian Conference on Grassland Invertebrate Ecology, Adelaide (Nov. - Dec. 1981), gave impetus for the completion of this Thesis. Also the assistance of Vasi, the typist, was of great value.
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