THE USE OF MIXED-AGE CULTURES IN THE MEASUREMENT OF RESPONSE TO PHOSPHINE

R.G.WINKS and E.A. HYNE

CSIRO, Division of Entomology P.O. Box 1700. Canberra, Australia
Fax: 6162464202

The conventional approach to the measurement of response to pesticides has been to use stable-age distributions of selected stages of insects so that the data can be subjected to rigorous statistical analysis using such methods as probit analysis. This approach may have merit when comparing the efficacy of different poisons and when determining changes in tolerance associated with the quantal response. However, this approach is usually not suitable for determining dosages likely to be effective in practice.

A more effective approach is to use mixed-age cultures and to determine times to population extinction. An advantage of this method is that it is not necessary to know which stage is the most tolerant. In addition, this approach allows for changes in tolerance during the exposure periods. However, it is essential that material used for testing contains all developmental stages and that adequate numbers of each stage are present to ensure a satisfactory degree of repeatability. This paper describes a method that is suitable for determining dosages that can be expected to be effective in practice. Data are presented to show the relative abundance of the different stages with a number of species and strains together with data to demonstrate the repeatability of the method.