FACTORS INVOLVED IN THE SUCCESSFUL USE OF HYDRAMETHYLNON BAITS IN HOUSEHOLD AND INDUSTRIAL PEST CONTROL

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Abstract—Commercial bait products are becoming increasingly important for household and industrial pest control. The advantages of baits are widely acknowledged and include convenience and ease of use, discrete placement of the insecticide, reduced environmental contamination and minimal disruption to the customer during application.

When ingested by an insect hydramethylnon inhibits mitochondrial electron transport and thus the formation of ATP, an essential energy supply for most biological processes. This unique mode of action makes hydramethylnon the ideal complement for modern pest control practices.

Laboratory and field testing of hydramethylnon baits against ants and cockroaches has provided a wealth of information relating to the many factors that can affect performance. This has led to improvements in the design and dispensing of baits.

It is recognised that there are some situations where insecticidal baits are used in conjunction with other pest control products. The successful integration of baiting and conventional treatments is discussed.

INTRODUCTION

Commercial bait products are becoming increasingly important in the control of cockroaches and ants. The advantages of baits compared with other methods of control are widely acknowledged. For example their discrete placement minimises environmental contamination and poses less hazard to operators, consumers and non-target organisms. There is limited interaction with surfaces making them suitable for use in more sensitive areas where the use of conventional surface sprays may be restricted. Their convenience and ease of use allowing applications to be made with the minimum mess and disruption makes a bait treatment highly acceptable from the user's standpoint.

There are however some disadvantages associated with baits. As a bait relies on the target pest visiting and feeding on the toxicant, activity, as judged by the user, tends to be slower than conventional control methods. This is particularly a problem in insect sensitive areas such as restaurants where rapid elimination of the pest in question is usually required. In these situations the integration of a non-residual, rapid acting space or surface spray in combination with a bait application may be an option. Baits must also compete with other food sources so correct placement can often be critical.

Since commercial hydramethylnon cockroach baits were first introduced in 1985 in the USA and in 1991 in the UK, laboratory and field performance against ants and cockroaches has been well documented (eg Milio *et al* 1986, Lucas *et al* 1992) and also supported by comprehensive product literature.

The purpose of this paper is to consider specific factors involved in the-successful use of the amidinohydrazone, hydramethylnon, in commercial cockroach and ant bait formulations.

The amidinohydrazones, a new class of insecticides, were first described by Lovell in 1979. The structure and activity of technical hydramethylnon was described by Hollingshaus and Little (1987), who demonstrated that amidinohydrazones had a unique mode of action, inhibiting energy production at the cellular level, hydramethylnon itself acting as a site II inhibitor of the mitochondrial electron transport chain.

This unique mode of action should avoid any cross resistance to organophosphate, carbamate, organo-chlorine and pyrethroid insecticides. The activity of hydramethylnon against resistant cockroaches will be considered below.

Laboratory trials with hydramethylnon baits presented to *Blattella germanica* demonstrated that this insecticide has a relatively slow mode of action, with symptoms of intoxication not evident within 24 hours of ingestion. (Hollingshaus and Little, 1987).

FIGURE 1

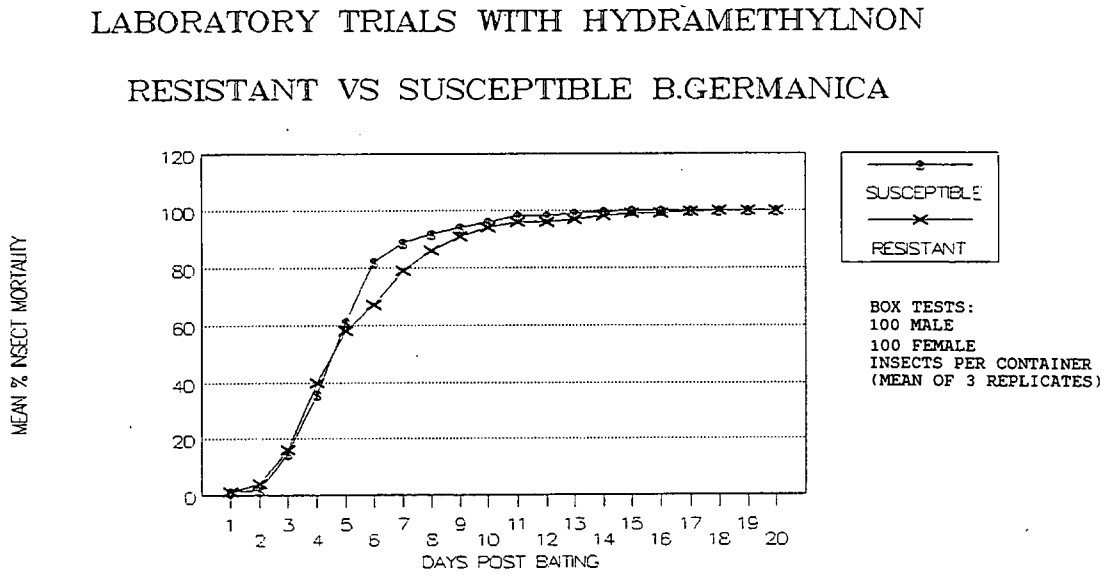

FIGURE 2