

STORED-PRODUCT INSECT BEHAVIOR AND PHEROMONE STUDIES:  
KEYS TO SUCCESSFUL MONITORING AND TRAPPING

by

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Introduction

Behavioral studies have played an important role in the development of insect pheromones. It has been important to consider factors such as crowding, photoperiod, age, mating status, and feeding and reproductive patterns. In our studies with Trogoderma species and other beetles, crowding played an important role in the production and release of pheromone. Several species of Trogoderma will not release the most active pheromone component when crowded because the "calling" or abdominal tipping is inhibited (Hammack et al. 1976; Cross et al. 1976). In Trogoderma, photoperiod and age have been shown to have a dramatic effect on pheromone production and also on response to pheromones (Shapas and Burkholder, 1978a). Mating status generally affects pheromone production in those species that utilize female-produced sex pheromones.

In contrast, the maize weevil, in which the pheromone is male-produced and promotes aggregation, mating did not reduce pheromone release by males (Walgenbach et al. 1983). The response by virgin females to the pheromone was significantly higher than response by mated females, but males of either mating status responded equally well (Walgenbach et al. 1983).

Behavioral studies have not been restricted to adults. We have studied the influence of the molting cycle on the aggregation response of Trogoderma glabrum larvae to wheat germ oil (Nara and Burkholder, 1983). The larvae responded to the food attractant during a relatively short period of time during the intermolt period. The response was highest immediately after a completed molt and reached a minimum just before the next molt.

Two general types of communication and reproductive strategies of stored product beetles have been reported (Burkholder, 1982). Adults are either short-lived (< 1 month) and require no feeding for reproduction; or are long-lived (> 1 month) and need to feed for reproduction. The short-lived adults such as the moths, dermestids, bruchids and anobiid beetles rely on sex pheromones for