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Biological Control with Insects: The Alligatorweed Stem-borer [1]

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(*Vogtia malloi* Pastrana Lepidoptera: Pyralidae: Phycitinae)

Host : *Alternanthera philoxeroides* (Mart.) Griseb. (Amaranthaceae)

Dr. George Vogt explored extensively for biological control agents of alligatorweed during 1960 to 1962, particularly in northern Argentina, southern Brazil and Paraguay. One of the most widespread species that he encountered was an undescribed moth, the genus of which was later named in his honor, *Vogtia malloi* . It occurred from tropical Guyana through tropical Brazil to temperate Argentina, and appeared to be a potentially effective biological control agent. After further study, approval for its release in the U.S. was granted in 1970. Releases were made during 1971 in southern Georgia and northern Florida and its effectiveness was apparent by 1972. Unlike the alligatorweed flea beetle, *V. malloi* appears capable of overwintering in northern areas.

The adult female deposits oval eggs (0.7 mm by 0.44 mm) singly on the undersides of young leaves near the leaf margin or in the midvein or in the leaf axil. The egg is white at first but becomes yellow as the embryo develops. It hatches in about 6 days. The larvae go through five instars over a period of about 24 days (at 23°C).

First instars immediately tunnel into the host plant through the 1st to 4th internodes of the apical stem portion. Older larvae may enter stems at a lower level and burrow upwards devouring wall tissue nearly to the epidermis. A single larva may destroy five to nine stems during the course of its development. The damage creates a distinctive tip-wilt that easily characterizes an infested mat. Pupation occurs within the stem in a sealed chamber created by the larva. The pupa is formed within a silken cocoon in a cavity in the stem. Prior to pupation the larva bites a circular hole (2 mm diameter) through the stem wall but not through the outer epidermis.

The adult moth emerges by rupturing the thin membranous epidermis covering the hole previously created by the larva. The adult is nocturnal. During the day it is quiescent and rests in an angled position, supporting itself with the four hind legs. Females lay

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an average of 267 eggs over a 6 to 8 day period. Females live 6 to 10 days and males 5 to 9 days.

The damage caused by *V. malloi* compliments that of *A. hygrophila*. Alligatorweed mats may recover from attack by one of these agents, but not from attack of both. Stems normally remain erect after defoliating attacks of the flea beetle but the burrowing of *Vogtia* larvae causes them to collapse giving the mat a flattened appearance. Much of the credit given to the flea beetle for alligatorweed control probably rightly belongs to *V. malloi*.