INSECT GROWTH REGULATOR (PRO-DRONE)
BAIT REMOVAL BY SOLENOPSIS INVICTA
(HYMENOPTERA: FORMICIDAE)

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With the cancellation of Mirex in 1978, environmentally sound alternative methods of control have been sought for the red imported fire ant (RIFA), Solenopsis invicta Buren (Banks and Schwarz 1980). An alternative method for RIFA control is the use of insect growth regulators (IGRs). These compounds, many with juvenile hormone (JH) activity, influence RIFA fecundity, metamorphosis, and caste determination, while exerting a more selective effect on non-target organisms than conventional pesticides (Banks et al. 1983, Loefgren & Williams 1982, Robeau & Vinson 1976). One IGR with JH activity [1-(8-methoxy-4,8-dimethylonyl)-4-(1-methylethyl) benzene], developed under the trade name Pro-Drone (Stauffer Chemical Company, Westport, Ct.), was field tested against the RIFA on ca. 53,000 ha in Chambers and Jefferson Co., Texas during 1983-1984. Herein, we report the rate of Pro-Drone removal by RIFAs under field conditions in these southeastern Texas counties.

Within the treated area, three disjunct sites, separated by 3-8 km, were located in improved pasture land. Approximately 5 h prior to aerial application of Pro-Drone, all vegetation was removed from 18, 1m², randomly-selected plots (6 plots within each site). A standardized bait formulation of Pro-Drone (once-refined soybean oil + IGR incorporated into pregel, defatted corn grits) was aerially broadcast at the rate of 11.86 g Al/ha on 21 October 1983. The number of bait particles falling within each cleared 1-m² plot was recorded. Colored pins were placed adjacent to each bait particle to mark its location. The rate of bait removal by foraging RIFA was monitored at 30-min intervals until all bait was removed. The bait removal rate was expressed as percent of total grits remaining through time. Site A was treated at 1230 h and a total of 383 grits (x = 63.8) was located in the 6 plots. Since both sites B and C were treated at 1600 h by 9 aircraft, data from these two sites were combined and totaled 451 grits (x = 37.6) in all 6 plots. Data obtained from all sites were analyzed by simple linear regression.

RIFAs removed ca. 50% and 70% of the IGR bait ca. 1 h after the 1230 h (early) and 1600 h (late) applications, respectively (Fig. 1). Four and one-half hours elapsed from the early application before 90% removal occurred, whereas 90% bait removal occurred within 2.5 h of the late application. Since higher ground and air temperatures existed at 1600 h (g = 27°C, a = 29°C) compared to 1230 h (g = 20°C; a = 23°C), greater numbers of foragers would be expected at that time. Therefore, the steeper negative
Fig. 1. Percent insect growth regulator (Pro-Drone) bait remaining every 30 min. at three disjunct locations in red imported fire ant, *Solenopsis invicta*, infested area, 21 October 1988 (data from sites B and C are combined—see text).

slope value (−0.46 as compared to −0.20) indicates greater foraging activity. Test for homogeneity (t = 2.17; df = 11) indicates that the slopes are significantly different (p<0.05).

The high coefficients of determination (Site A: $r^2 = 0.88$; Sites B and C combined: $r^2 = 0.87$) indicate that the linear model describes the data well during both time periods. Therefore, these coefficients indicate that the RIFA was thoroughly “canvasing” the sites and that bait removal was a function of time.

Although using IGRs as control tactics is more selective than using conventional chemical insecticides, uncertainty remains as to the effect on non-target ants. Although Pro-Drone bait is formulated for RIFAs, other “oil-loving” ant species may be attracted to the bait. However, we observed no other invertebrate nor any vertebrate species foraging on the baits. Since all of the bait was collected by the foraging RIFA within a short time period, we suspect that at least a large majority of bait-formulated Pro-Drone reached the target organism. Contribution No. T-10-165, College of Agricultural Sciences, Texas Tech University (Mention of a commercial or proprietary product does not constitute an endorsement by Texas Tech University).

**REFERENCES CITED**

EFFECT OF YARN ON ATTRACTIVENESS OF THE WILLIAM TRAP TO STOMOXYS CALCITRANS (DIPTERA:MUSCIDAE) ADULTS

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The stable fly, Stomoxys calcitrans (L.), is an extremely noxious pest of man and livestock in Northwest Florida (Brown & Williams 1974 and Hogsette, et. al. 1981). Because of the economic impact of an invasion of these flies on the beach resorts along the Gulf Coast, the state routinely sprays the beaches with naled whenever flies reach a certain annoyance level (20 flies/man/minute, Brown personal communications). While this control technique is effective, alternative measures must be investigated to reduce the fly populations below an economic threshold.

A standard method, which has been used for years to monitor stable fly populations in N.W. Florida and throughout the world, is the Williams Trap (Williams 1973). The fiberglass panels (Alsynite™) reflect ambient light in a UV wavelength that is very attractive to stable flies (Agee & Patterson 1983). When the adhesive Tack Trap™ is applied to the fiberglass, it does not initially decrease the attractiveness of the panels to the flies, however, as flies accumulate on the panels, the traps' attractiveness is decreased. The Williams trap can be modified from a monitoring device to a control device by coating the fiberglass panels with various formulations of synthetic pyrethroids (Meifert et. al. 1978). While this technique is effective it has drawbacks because only technical material in acetone is effective for more than a few days. Formulated material, such as emulsifiable concentrates or wettable powders, does not adhere well to the impervious surface of the fiberglass, consequently, any heavy dews or light rains will wash off the chemical. A more recent modification, which has shown more promise, involves wrapping the fiberglass panels with white Orlon™ yarn which has been impregnated with 1% permethrin EC solution (Koehler & Patterson 1982).