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 Tuck 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).
The purpose of this study was to determine the optimum yarn spacing, i.e. how much of the panel surface could be covered with yarn without significantly reducing the attractiveness of the fiberglass, and also to improve the yarn wrapping techniques designed by Koehler and Patterson.

The study was conducted in September and October of 1982 at Grayton Beach, Walton County, Florida, where high stable fly populations were present. The white Orlon yarn was wrapped in a continuous coil around the long axis of the panels. Panels were notched top and bottom for uniform yarn spacing at the desired intervals. After wrapping, panels and yarn were coated with Tack Trap and supported 90 cm above the ground on short wooden stakes. Four experimental yarn spacings were tested: 0.0, 0.64, 1.27, and 2.54 cm between strands. Standard Williams traps were used as checks. Traps were placed on the beach between the high tide mark and the dunes and arranged in a 5 X 5 latin square design. The distance between each trap was 6.1 m. Flies caught on each trap were counted at 24-h intervals. After each count, traps were cleaned with hexane, allowed to dry, and then recoated with Tack Trap in preparation for the next trapping interval.

The mean number of stable flies caught on the yarn wrapped panels (Table 1) were subjected to ANOVA and the means compared by Duncan's new multiple range test. The different distances between yarn strand wrappings on the Williams trap did influence the attractiveness for flies to the panels. Consequently, the more yarn strands wrapped on the trap, the fewer flies were caught. The greatest number of flies were caught when the distance between yarn strands was 2.54 cm. However, the Duncan's multiple range test shows that there is no significant difference when the distance between yarn strands is 2.54 and 1.27 cm. However, since the yarn is to be impregnated with permethrin, the 1.27-cm spacing increases the chances that flies attracted to the panels will contact the pesticide. In the field, no Tack Trap will be used to trap the flies. Therefore, without the accumulation of flies on the trap surface, the attractiveness of the traps will remain at a maximum at all times. Besides providing more impregnated yarn per unit area, wrapping the yarn around the panels in a continuous coil proved to be much more convenient than the criss-cross method suggested by Koehler and Patterson.

Field studies of this new design of yarn-wrapped panels for the control of stable flies at dairy farms have shown it to be as good as, if not better than, the one designed by Koehler and Patterson. This design saves considerable time and effort over the previous one and should be adopted for field control use.

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**TABLE 1. NUMBER OF STABLE FLIES CAUGHT ON STICKY TRAP PANELS USING ORLON YARN STRANDS AT GRAYTON BEACH, FLORIDA.**

<table>
<thead>
<tr>
<th>Distance between each yarn strand (cm)</th>
<th>Number of flies caught on panels</th>
<th>Mean^3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check</td>
<td>1,846</td>
<td>369.1 a</td>
</tr>
<tr>
<td>2.57</td>
<td>1,154</td>
<td>230.7 b</td>
</tr>
<tr>
<td>1.27</td>
<td>1,127</td>
<td>225.5 b</td>
</tr>
<tr>
<td>0.64</td>
<td>414</td>
<td>82.7 c</td>
</tr>
<tr>
<td>0.00</td>
<td>185</td>
<td>36.9 c</td>
</tr>
</tbody>
</table>

^3Means followed by the same letter are not significantly different (p<0.01).
F = 11.55, df = 4, MSE = 7086.4, S of S = 349987.9
habilitative Services, State of Florida. Mention of commercial or proprietary product does not constitute endorsement by the USDA or DHRS.

REFERENCES CITED


