2005 Annual Red Imported Fire Ant Conference. Gulfport, MS.
March 22-24,2005

Use of baits for evaluation of fire ant populations in the USDA areawide project

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In sites used in the USDA-ARS Areawide Fire Ant Suppression project, fire ant populations are monitored using baits (ant activity monitoring) or mound counts (mounds rated using the USDA Population Index [PI] rating). For ant activity monitoring, 10 slices of beef wieners are placed about 8-paces apart in a circle around the sampling plot centers. After 30-60 minutes, baits are observed and rated from 0-4 depending on number of fire ants present at the bait. These observations allow the calculation of % of baits where IFA are present. All mounds present in the sampling plots are counted and given a rating varying from 1-10 depending on the number of ants in the nest and the absence (rating = 1-5) or presence of brood (rating = 6-10).

The treatment threshold used in this program is 20 mounds with PI>7 per acre, but no threshold has been established using the ant activity monitoring baits. Therefore, we were interested whether the ant activity as measured in the beef wiener baits corresponded to the level of ant population as measured by the mound counts and PI rating. This is important because the ant activity monitoring is: easier to use, less labor- and time-intensive, more efficient in detecting low populations, and serves as an indicator of adequate time for chemical bait applications because it determines if foraging is occurring.

Data from all 5 cooperating states show that there is a strong correlation between the ant activity as measured by the baits and the ant population as measured by number of mounds or the PI. Although the correlation is stronger when using the rating for the number of ants present at the baits, the percentage of baits occupied by fire ants also provide reliable information, with lesser requirement in effort and technical knowledge by the operator. The ant activity bait responds rapidly to an increase in ant population, and baits can be quickly overwhelmed by fire ants if populations are above levels usually considered damaging and in need of control. The pre-established threshold (20 mounds/acre) corresponds to 30-45% of the baits occupied by fire ants.

In a simulation in the laboratory, the ant activity bait data were used as the decision tool in determining the need for fire ant control treatment in the different demonstration sites for the areawide project over the past 3-4 years. The decisions to apply formicides were similar in >80% of the times whether the mound counts-PI or the ant activity bait (% of bait occupied by fire ants) were used. Variation of the data negates any differences in the decisions when the different methods were used.

In conclusion, ant activity monitoring baits (slices of beef wieners) are good indicators of fire ant populations in pastures. Compared to mound counts-PI, ant activity baits tend to underestimate the ant population in cooler months and overestimate the ant population in

warmer months. However, because they are easier and less expensive to use, the ant activity monitoring baits can be recommended as a simple, user-friendly method for evaluation of fire ant populations, and as a decision tool in fire ant control programs.