

# Horn Fly Management in Cattle: Helping Producers Reduce Insecticide Resistance and Regain Control

## Educational Objectives

Horn flies are the most economically significant external pest of cattle, costing the cattle industry hundreds of millions of dollars each year. Producers have many insecticide options and delivery methods available to combat horn flies, however, choosing the right product can be daunting. This often leads to unintentional repeated misuse of the same insecticide classes year after year. Through repeated misuse of insecticides, horn fly populations have developed significant resistance to many of our available products.

In Alabama, insecticide impregnated ear tags are one of the most common methods used for horn fly control. As with other products, repeated use of the same insecticide class has resulted in horn fly resistance, leading to product failures. The purpose of the project was to (1) evaluate resistance and efficacy of insecticide impregnated ear tags in Alabama, (2) educate producers on integrated pest management strategies for external parasites of livestock, and (3) Reduce pesticide load through proper selection and application of products.

## Program Activities

The research component of this project was funded by a grant from the Alabama Beef Checkoff. There are currently tags labeled for horn fly control from three insecticide classes: organophosphates, pyrethroids, and avermectins. Six brands of fly tags were tested: two organophosphate tags (Patriot® and Corathon®), three pyrethroid tags (Python Magnum®, Saber Extra®, and CyLence Ultra®), and one avermectin tag (XP 820®). The six fly tag brands constituted the treatments, the experiment was replicated twice, giving 12 treatment herds and two control herds. The tags were placed in 12 herds averaging 30 head across Southwest Alabama. Tags were applied according to label directions once horn fly numbers reached the economic threshold (200 flies/animal). Tags were assigned based on the prior year's horn fly control tactic (not randomly assigned). For example, if herd A had used pyrethroid sprays as their horn fly control method in the previous year, we assigned herd A with either an organophosphate or avermectin tag. Accounting for previous years control method allowed for a true test of the fly tag while also accounting for possible resistance in the local horn fly population. After placement of tags, fly counts were taken by choosing five treatment cows at random and recording the total flies on each cow. Counts were taken on a weekly basis until either: tag failure was noted by reaching economic threshold, or fly season ended. Upon tag failure/end of fly season, tags were removed from the treatment groups.

Data from the trial was compiled and analyzed as the basis for the extension component of the project. Results were used to (1) prepare appropriate reports for Alabama Beef checkoff, (2) prepare and present programming to producers participating in The Alabama Cattlemen's Association State Convention and Trade show, (3) prepare individual integrated horn fly protocols for participating study producers, (4) prepare multiple extension publications and decision tools for integrated horn fly control

that stresses minimizing both resistance and environmental impact, and (5) updating appropriate IPM recommendations for Alabama Livestock Producers.

### **Teaching Methods**

Teaching methodology revolved around both traditional and innovative pedagogical philosophies. Since the days of the Jessup wagon extension educators have searched for innovative and forward-looking producers as cornerstones for on-farm demonstrations, and that is precisely what was done with the first piece of this program. Producers were sought that were progressive and innovative, while at the same time being respected amongst their peers locally and regionally. Each producer was visited numerous times, with data gathering and on-farm analysis of their given situation. Then, time was dedicated to educating each producer on horn fly biology, integrated pest management strategies, and the research design component of the project. Producers were then updated weekly as results were gathered, and educator/producer consultations took place periodically. Producer participants were then made aware of results and farm employees trained to understand pest identification, horn fly load analysis, and formulation of best management practices for environmentally sound and economically sustainable pest control.

The second piece of the program focused more on traditional pedagogy. Educational programming was designed and built to include PowerPoints, publications and other assorted materials focused on horn fly control in livestock. Conventional and digital print media was used, along with in-person and virtual educational presentations.

### **Results**

The on-farm research piece of the project produced control groups that consistently showed a higher fly count (economically significant) than all treatment groups throughout the study. All fly tag treatments maintained horn fly numbers below economic threshold throughout the season. The Python Magnum® tag was associated with a higher fly count compared to the other tags, but the levels were still below economic threshold. There was not a statistical difference between the other five tags. Producers were trained (at their requests) to select fly tags that matched their needs and incorporate them into a more holistic approach to integrated pest management that includes pasture rotation and other physical management practices to maximize control and minimize impact.

The off-farm piece resulted in multiple extension publications, on person and virtual trainings, social media outreach and additional extension outreach programming.

### **Impact Statement**

Producers were enabled through research and extension to control the most significant economical external pest of cattle in Alabama in a manner that is environmentally sound and sustainable. Farmers are the original environmental activists, and by enabling them we helped to ensure both environmental and fiscal sustainability.

### **Evaluation**

Evaluation of program participants indicated 100 % adoption of the sustainable integrated management protocol suggested by ACES.