EFFICACY OF USING PARASITIC WASPS TO CONTROL STABLE FLIES IN KANSAS FEEDLOTS

***G. L. Greene*[1] *and J. E. Cilek*[1]**

Summary

Release of parasitic wasps has resulted in stable fly reductions averaging 28, 42 and 38% for 1991, 1992, and 1993, respectively, with considerable variation from feedlot to feedlot. Costs for parasites plus sampling averaged $.23, $.32 and $.26 per animal during 1991, 1992, and 1993, respectively. Because stable flies are estimated to cause losses of $5.00 to $30.00 per animal, these costs are very reasonable.

(Key Words: Cattle Feedlot, Stable Fly, Fly Parasites, Pest Management Costs.)

Introduction

Research on feedlot fly reduction with fly parasite releases has shown considerable promise since 1991. *Spalangia nigroaenea*, a fly parasite collected in southwest Kansas, has been used in this program. It attacks stable fly pupae and prevents fly emergence. The use of parasites to replace insecticides is needed because flies have become resistant to many of the available insecticides, and insecticides are becoming less available for livestock use. To determine the efficacy of substituting biological control methods for chemical applications, levels of fly reduction and related costs must be known.

Experimental Procedures

Costs for parasites and sampling fees are based on 4, 18, and 17 feedlots for 1991, 1992, and 1993, respectively. Four to six additional feedlots, where parasites were not released, were sampled each year as controls.

Adult fly numbers were monitored by placing Alsynite sticky traps at the margins of each feedlot. Each week, the number of stable flies trapped was recorded, and the sticky covers on the traps were replaced.

Costs reported reflect the average paid by cooperating feedlots. A sampling fee was established to cover sampling costs. This fee differed each year and from feedlot to feedlot, depending on size. During 1991, feedlots were charged for parasites only. In 1992, a sliding scale was established with smaller feedlots paying more per animal than larger feedlots. During 1993, $.10 per animal was charged with a maximum of $5,000/feedlot, which resulted in a cost of less than $.10 per animal for the large feedlots.

Results and Discussion

The costs per animal showed considerable variation (Table 1) ranging from $.03 to $1.55. This difference was related to

[1]Southwest Kansas Research Extension Center, Garden City, KS

cleanliness and/or excess fly breeding areas. During 1993, the maximum sampling costs increased because of an extreme amount of wet manure. Average sampling and total costs decreased from 1992 to 1993 as a result of delayed fly development during 1993. Parasite costs remained at $.08 per animal during 1992 and 1993. A total cost of $.26 per animal for 1993 was very reasonable considering the wet, cool season.

Numbers of stable flies caught were greater during 1993 than 1992 (Table 2), even though the populations were greater in 1992. This may have been the result of the sticky trap covers holding flies better during 1993. The relative costs for feedlots with low and medium fly populations switched from 1992 to 1993. The larger feedlots held both parasite and total costs per animal down for the medium level in 1992 and the low level in 1993. The single feedlot with a low fly level and costs of $.87 had a large fly breeding area where high numbers of parasites were released. Fly counts documented that large parasite releases held the fly numbers down, even in a heavily infested feedlot.

Cost of parasites was lower for the feedlots with a high fly level during 1993 than 1992 ($.27 vs $.42 per animal, respectively). Most of this cost reduction was due to the later buildup of stable flies during 1993.

In 1982, the average cost for parasites was $.05 per animal. The cost rose to $.10 per animal during the mid-1980s and to about $.30 during the late 1980s. Consequently, the current charge of $.26 per animal for the KSU fly management experimental program appears reasonable. However, the costs of $1.34 and $1.55 per animal for the most expensive feedlots are excessive. These costs suggest that sanitation improvement should precede fly parasite releases. Additionally, we should note that we have observed lower fly populations in feedlots where *S. nigroaenea* were released during previous years, suggesting carryover benefit.

The average reduction in stable fly populations measured by Alsynite traps is shown in Table 3. These reductions roughly parallel the rates of parasitism for 1991 and 1992. Parasitism data for 1993 are not yet available.

Table 1. Costs per Animal for Stable Fly Management in Cattle Feedlots with Parasite Releases, 1991-93

Year	No. of Feedlots	No. of Cattle/Lot (1000's)	Cost, $ per Head: Parasites	Sampling	Total
1991	4	54 (4.2-100)[a]	.08 (.05-.10)	.18 (.07-1.55)	.26
1992	18	48.9 (2.2-100)	.08 (.03-.30)	.24 (.06-1.10)	.32
1993	17	45.4 (2.2-100)	.08 (.05-.10)	.18 (.07-1.55)	.26

[a]Numbers in parentheses are the range from low to high.

Table 2. Comparison of Fly Level or Degree of Sanitation Relative to Costs for Parasites and Sampling during 1992 and 1993

Fly level[a]	Year	No. of Lots	No. of Cattle/Lot (1000's)	Cost, $ per Head Parasites	Cost, $ per Head Total
Low					
(45-53)[b]	92	5	9.8 (2.2-22.3)	.26	.37 (.27-.52)
(104-126)	93	6	34.7 (2.2-100)	.13	.18 (.12-.87)
Medium					
(107-138)	92	7	45.6 (9-100)	.18	.24 (.09-1.15)
(143-170)	93	5	23.0 (12-35)	.22	.29 (.20-.50)
High					
(184-253)	92	6	20.0 (7-37)	.42	.54 (.33-1.34)
(197-469)	93	6	14.9 (4.2-41)	.27	.37 (.25-1.55)

[a]Flies per Alsynite trap per day
[b]Numbers in parentheses are the range from low to high.

Table 3. Stable Fly Populations in Parasite Release and Control Feedlots

	Stable Flies per Trap per Week		
Feedlot Treatment	1991	1992	1993
Nonrelease	37	200	251
Release	27	116	156
% Reductions	28	42	38