

A Common Method of Barn Fly Control: Debunked

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Abstract: In the state of Texas, flies cause major damage to livestock facilities statewide. Many southern farmers believe that a simple plastic bag full of water with a penny submerged on the bottom will repel flies for extended periods of time with perceived reasons for success varying. Some believe it blinds the flies, other believe the flies see their reflection magnified and flee from a perceived predator. For the purpose of this experiment, a manner of pest control that has been considered an unconventional urban legend will be evaluated for its effectiveness in repelling flies. The results of this experiment found that there is no correlation with the bag of water and decreased amounts of captured flies and may be used to find an alternate method of insect control.

Keywords: pest control, bag full of water

In Texas, it is common to see bags full of water with a penny submerged at the bottom and hung from a high place. This is used to repel flies. When asked why this works, responses vary, but the most common explanation is that incoming flies see their own magnified reflections and flee from what looks like a larger insect. Places this practice is most seen include homes, front porches, and private barns. Barns provide an ideal environment for diverse species of flies due to their ability to provide sites to lay eggs, and resources for maggots to grow. The availability of livestock manure is possibly one of the most driving factors behind increased populations of flies in livestock facilities because many species fecal matter, especially chickens, causes fly larvae to mature more rapidly than in other materials (Khan, Shad, & Akram 2012).

Barns in this region of Texas almost exclusively contain house flies, or *Musca domestica*. The *Musca domestica* is remarkably common in most all barns and households and is known for carrying more than 100 pathogens affecting both people and animals alike ((Malik, Singh, & Satya 2007). Their capacity to carry disease makes their presence both a costly liability and a health hazard.

The theory surrounding the bag of water seems to have some nostalgic protection surrounding it as no part of this experiment proves the bag of water trick works. The purpose of this experiment is to prove that the urban legend is completely false.

Materials and Methods

To discover if the bag of water trick was true, a total of five strips of flypaper were hung across the rafters of a commercial sheep barn (Harris Livestock, Midlothian TX). All fly traps were approximately 3 meters off the ground and four strips were spaced at intervals of .6m, 1.2 m, and 1.8 m away from the first trap .The fifth fly strip served as a control group 3 m away from the first flystrip placed.. A bag full of water with a penny in the bottom was nailed into the rafter just above the first bag meaning that the bag ten feet from it served as a control.

The doors of the barn were left open and all fans were turned off to allow flies to enter the barn freely where the fly traps were left for 48 hours.

Each flypaper strip was 60 centimeters long and 5 centimeters wide double sided strip meaning that a total surface exposed area of 243.84 cm. The flypaper strips were removed and the amount of flies per square centimeter was recorded and a correlation coefficient was calculated.

Results

The control fly strip was placed approximately 3 meters away from the bag

of water and collected a total of 95 flies over the span of 48 hours. This means that there was approximately .38 flies/cm² of exposed fly paper.

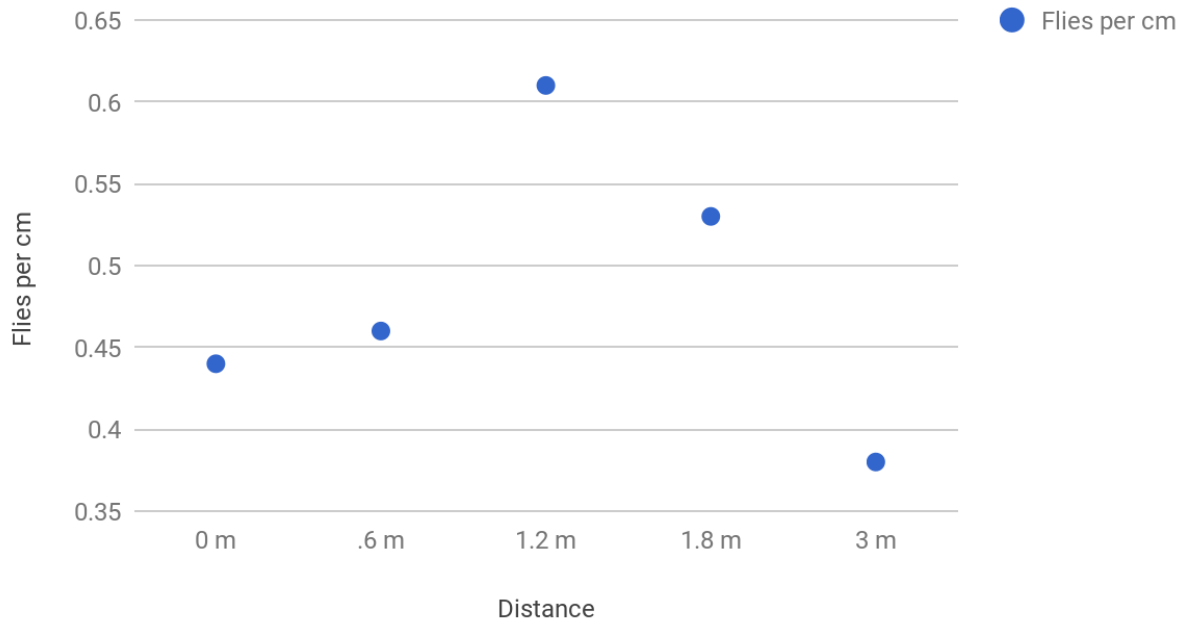
However, the fly strip with the bag near it stuck to the bag, taking up 15 cm. of the strip itself and the other side of the strip was stuck to the rafters leaving only 121.92 centimeters of exposed fly paper. In that space there were 54 flies or .44 flies/cm². This is significantly more flies than observed in the control group.

The other three fly strips placed .6 m, 1.2 m, and 1.8 m away from the bag also collected substantial amounts of flies. The strip at .6 m had 112 flies or .46 flies/cm², the strip at 1.2 m away captured 149 flies, or .61 flies/cm² and the strip at 1.8 m away had 130 flies or .53 flies.cm².

When placing the data on a graph, X values represent the placement away from the bag in feet and Y values indicate the amount of flies per exposed square inches of fly paper. The correlation coefficient is -0.2262, revealing the relation between distance from the bag and amount of flies per square centimeters is weakly and negatively correlated.

Distance from bag	0m	.6 m	1.2 m	1.8 m	3 m
Total flies	54	112	149	130	95
Flies per cm	.44	.46	.61	.53	.38

Flies per cm vs. Distance



Discussion

The correlation between the distance of a flypaper from the bag of water and the amount of flies per square cm captured was so small it was negligible which rejects the hypothesis that a bag of water containing a penny will repel flies. What small correlation the data did show revealed that the bag in question could have moderately attracted flies as the data shows. The graph starts out positively correlated, but then suddenly becomes negative, hitting the maximum at four feet from the bag. Had the bag truly repelled flies as efficiently as the theory had suggested a uniformly positive correlation should have been observed.

The thought process behind the myth is that flies see their own reflection and attempt to

escape it. However, basic physics claims that water does not bend light, rather it refracts light. To fully explain why the myth failed to repel flies, one must understand how a fly sees the environment around it. Flies such as the house fly do not have accurate depth perception but rather they view the world from a panoramic perspective (Miorelli 2015). This means that not only does the light being refracted in the bag fail to disorient the fly, but possibly explains why the flies do not appear to change their flight pattern when encountering the plastic bag. An alternate hypothesis is that a fly most likely cannot detect where the bag is due to poor depth perception and thus doesn't make any attempt to avoid it.

References

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