
Fly Control for Cattle

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Cows will give more milk and calves put on more weight by simply ridding cattle of flies. In the U.S., university researchers found that moderate horn fly control with insecticides (organosphosphates and pyrethroids) resulted in a 17% greater weight gain in treated cattle over a three-year period. Similar increases in productivity have been reported for weaning weight of cattle (4.5 to 6.8 kg /10-15 lbs increase) and milk production (10-20% increase).

Horn flies, *Haematobia irritans*, congregate on the backs of cattle, often clustering on the midline and spreading down the sides. Sometimes horn flies settle around the bases of horns, and if the weather is extremely hot, they may move onto the belly. The horn fly feeds on blood, biting its host up to 20 times per day. Often cattle are bothered by more than 100 flies that cause a blood loss of 1 to 2 grams per day (for every 100 flies). The irritated cattle lose condition (Ed: no longer appear in prime health) due both to restlessness while beating their tails and shaking their heads and to the resulting reduction in the amount of fodder eaten. Defense reactions and the pain due to bites result in reductions in milk production of up to 50% per day and in weight gains of up to 300 grams (2/3 lbs) per day. Horn flies also are potential vectors for trypanosomes and other parasites.

Other flies, including buffalo flies (*Lyperosia* sp.) and stable flies (*Stomoxys calcitrans*), cause similar problems as the result of biting and sucking. Distribution of these flies is generally worldwide, including the tropics.

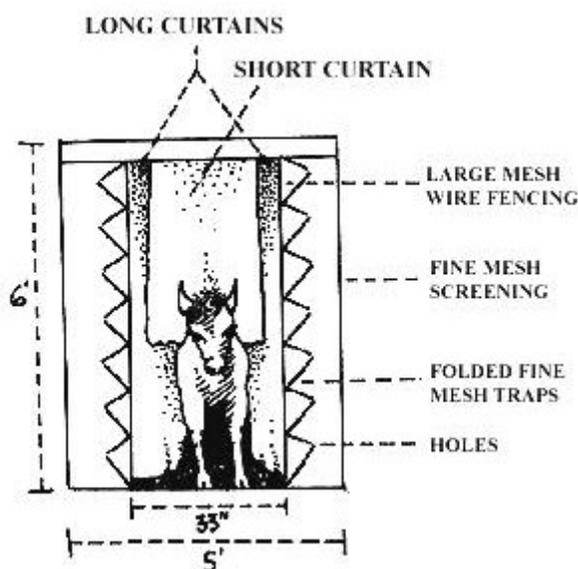
Adult horn flies remain almost constantly on the host. After the flies feed and mate, the female is ready to deposit eggs. The female oviposits into freshly dropped cattle manure. The development of the eggs passes through three larval stages and a pupae stage in the manure, before the adult stage emerges. The larval and pupae stages require a high humidity environment (fresh manure) and temperatures of 27-33°C (80-91° F). Development into adults can take up to 29 days in cool climates and can be as little as 10 days under warm conditions. Horn flies breed to enormous numbers very rapidly.

Conventional (non-chemical) control methods are focused on sanitation. The removal and stacking of animal manure and decaying hay and straw out of reach of the fly greatly reduces its numbers. Practices that prevent a high humidity environment during development will reduce fly numbers; for example, spreading out straw and hay will cause it to dry out sufficiently to prevent development of flies.

Herds that are not well managed (e.g., that receive no supplemental nutrients or are otherwise poorly nourished) show even greater responses to fly control. So one would expect that fly control would be an efficient way to improve cattle production in developing countries. However, fly control that is dependent on pesticide use will be out of the reach of many farmers. In addition, horn fly control measures dependent on pesticides are in jeopardy due to horn fly resistance to pyrethroid insecticides.

Horn flies have been controlled with insecticides in the U.S. since the early 1950s. An alternative, mechanical means of control (horn fly trap) was developed prior to World War II, but this never made its way into mainstream agriculture because of the growing use of pesticides following the war. The horn fly trap is now being promoted as an effective means of controlling not only horn flies, but also stable flies, face flies and house flies.

William Bruce developed the walk-through trap in 1938. In field tests done in Missouri in 1986, the trap provided 50 to 70% control of horn flies. Numbers were kept at less than the 200 per cow that has been quoted as a threshold number above which economic losses occur (note: the threshold number may be lower for animals maintained under suboptimal conditions). The researchers in Missouri also found that horn flies migrate very little, and when flies are trapped, there is very little re-infestation from adjacent areas.



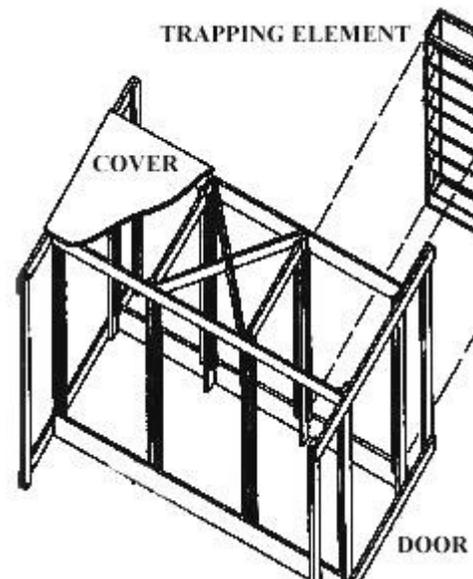
The Bruce trap is most effective where cattle must pass through it on a regular basis. The best site for placement is between a pasture area and a source of water; however, any scheme that encourages cattle to pass through the trap will work (e.g., fencing to route cattle, mineral blocks, molasses). Over time, cattle are trained to walk through the fly trap

as part of their daily activities. It has been said that "cows like using the traps so much that sometimes they don't want to come out" because they learn to associate the trap with a lack of biting flies.

Details of the Bruce trap are quoted below, but it will be difficult to build from just a verbal description. If at all possible, obtain the blueprints at the address given at the end of this article.

"The trap is of simple construction and can be built at relatively small cost. The framework of the trap is 5 feet wide, 6 feet high and 10 feet long (1.5 x 1.8 x 3 m). The base of the frame is made of 2 x 8 inch (5 x 20 cm) lumber, the remainder of 2 x 4 inch (5 x 10 cm) lumber. All pieces are securely bolted together with 3/8 inch (9.5 mm) bolts. The top is made of any inexpensive lumber. The passageway through the trap is 33 inches (0.8 m) wide and approximately 6 feet (1.8 m) high, and is lined along the sides with heavy largemesh wire fencing. On each side of the frame, set side by side behind the wire are three screen trapping elements, each 37.5 inches (0.95 m) wide, 10 inches (0.25 m) deep and 5 feet (1.5 m) high. These screen trapping elements are made of 18-mesh, galvanized screen and are of a modified tent-trap construction - i.e. the screen of the trap facing the passageway is folded in a series of z's. The apertures through which the flies enter the trapping element are 3/16 x 3/8 inches (5 x 9.5 mm) and are placed 3/4 of an inch (19 mm) apart along the inner acute angles of the z's. Each trapping element is provided with a door through which the dead flies are removed.

"Two sets of curtains and six weighted strips are used to dislodge the flies from the cattle as they pass through the trap. Each set of curtains consists of three pieces of carpet [Editor: Or other appropriate materials such as feed sacks]-two pieces 20 inches x 6 feet (0.5 x 1.8 m) and one short piece 24 x 30 inches (0.6 x 0.8 m). The two long pieces of one set are attached to the frame at the top and sides of the passageway between the first and second pairs of trapping elements. These long curtains, being fully one-half as wide as the passageway, meet at the center. The short piece is suspended from the top at the same place of attachment as the long curtains. This serves to brush the flies



from the backs of the cattle and also to darken the space above the animal, which is opened by the parting of the long curtains. The other set of curtains is installed in the same manner between the second and third pairs of trapping elements. The weighted strips are made of carpet 4 inches (10 cm) wide and about 6 feet (1.8 m) long and are suspended at irregular intervals from the top of the trap between the two sets of curtains. The weights consist of small pieces of lead, iron, or other heavy metal weighing at least 4 ounces (113 g), which are riveted to the strips near the lower end. These weighted straps flap about the body and legs of the animal as it passes through the trap and dislodge flies not reached by the curtains.

"It will be noticed that the placing of the z-shaped trapping elements along the walls of this trap takes advantage of the tendency of horn flies to fly outward and upward when they are brushed from an animal. Stable flies also rarely fly directly upward. The construction of the trap is such as to allow as much light as possible to enter, particularly on the side walls of the entrance section. This feature prevents the escape of any great numbers of flies through the entrance opening."

A couple of notes of explanation are needed here. When flies are brushed from the backs of cattle they move toward the screens because they are attracted to light. The top to the trap tends to be dark because the curtains and carpet pieces are hung from this area. The zshaped trapping elements work on the basis of the "inverted cone" principle. The traps force the flies to crawl from a large opening (acute angle of the z) through a small one (holes made in the mesh where it is bent to form the angle). Once the flies have passed through these holes the cone now faces the wrong direction. Not many flies will find the holes and escape.

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