

Fly Control in Cattle Feedlots

With Residual Sprays

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A spray rig with easily constructed booms to convey the hoses over fences can be used in the practical application of residual fly control chemicals to feedlots. Diazinon is the most effective and economical of the several materials tested in the Imperial Valley, where no significant resistance to the chemical has been observed thus far.

LARGE POPULATIONS of domestic flies—mostly *Musca domestica*—in commercial beef feedlots not only annoy cattle and personnel, they can also create a serious nuisance in adjacent farm areas, particularly where urban developments border feedlot operations. Good management practices such as proper grading of corral surfaces to permit drainage, frequent disposal of animal wastes and organic matter, proper construction of float valves on water troughs to help minimize overflow or leakage, and general farm sanitation help to reduce natural fly attractants and breeding sources. However, chemical fly control is occasionally necessary to supplement such sanitation methods.

Investigations were begun in 1963 to determine the effectiveness of several insecticides for chemical control of flies.

Diazinon, Korlan (ronnel) and Cygon (dimethoate) were tested independently on three separate feedlots in the Imperial Valley. These materials were applied as surface sprays to the underside of shades, outside surfaces of feed troughs, to corral fences and to outside surfaces of adjacent buildings. Diazinon was applied as a 0.5% spray, while both Korlan and Cygon were applied at a 1.0% concentration.

Applications were made using a 100 gallon Bean sprayer, operating with 50 to 60 lbs pressure. The sprayer was mounted on a one-ton pickup truck fitted with a 75-ft length of ½-inch high-pressure rubber hose, and with an orchard spray gun on each side at the rear. Since it was impossible to drive this equipment into each corral, it was necessary to lift or drag the hoses through or over the corral fences from either side of the feed alley to spray the cattle shades and other fly-resting surfaces. This procedure proved to be time consuming and laborious.

The fly control spraying was evaluated by using sticky boards, caged flies exposed for one hour to a treated surface, and by general observation of flies found resting on fences, feed troughs, and outside surfaces of buildings. Diazinon provided the best and most economical fly control over the longest period of time.

Additional tests were conducted in 1964 to obtain more precise information on the effectiveness of Diazinon, to improve the efficiency of the spray equip-

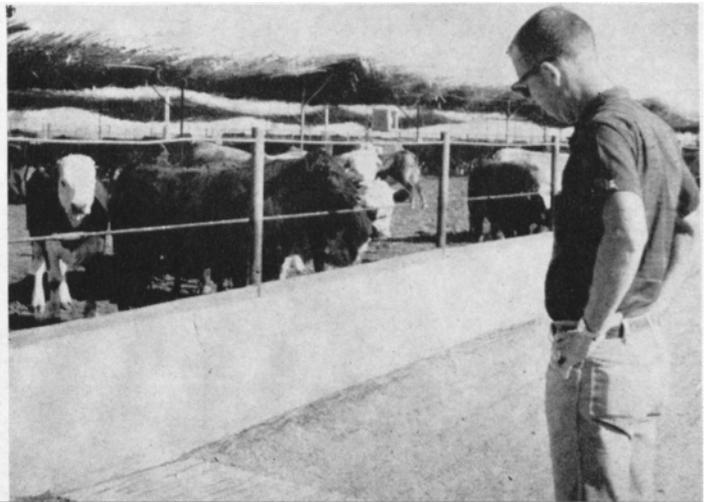
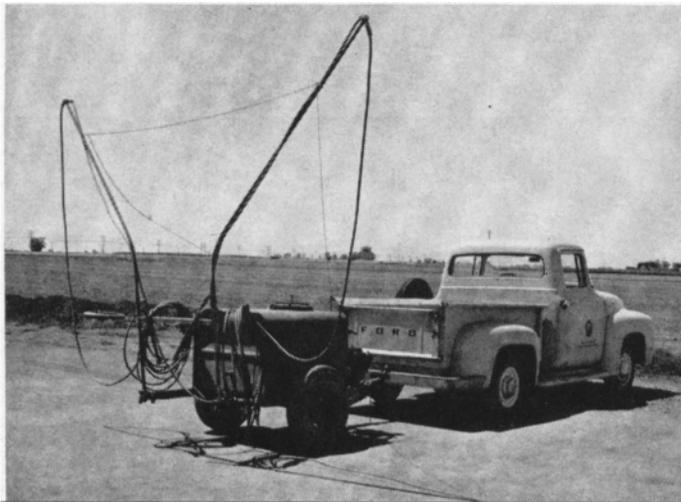
ment, and to study fly resistance to this chemical. The two feedlots selected for the tests were near Brawley in the Imperial Valley. The San Pasqual Land and Cattle Company (feedlot "A") was located about five miles northwest and the Dahm feedlot (feedlot "B") was located about five miles west. These feedlots were selected for their similarity of operations, structures, and feeding times. Both operations had work alleys in a north-south direction and fed steers ranging in weight from 400 to 1,000 lbs. Each lot operated at about three-fourths capacity throughout the test, with feedlot A containing about 5,000 head and feedlot B with 1,500 head.

Feedlot B was sprayed with 50% Diazinon wettable powder at a 0.5% concentration on May 4 and a 1.0% concentration on June 2 and July 8, 1964. Each spray treatment required 300 gallons. Feedlot A was used as a check for natural fluctuations in the housefly population and was not treated.

Spray equipment improved

The ranch-modified spray rig used in the 1964 tests (see photo) was trailer-mounted and contained a 150-gallon spray tank with a mechanical agitator and a 400 psi pump powered by a 10 hp air-cooled engine. The rear of the sprayer was fitted with two aerial booms, each carrying 75 ft of ½-inch high-pressure rubber hose and orchard spray guns containing number 8 size discs. The 10-ft-high booms were made of 8-ft lengths

Trailer-mounted spray rig, left photo, used in these tests features tubular steel booms to support hoses and prevent snagging on fencing as sprayer moves through the feedlot. Fly grill seen on feedlot driveway, right photo, was used to count fly population levels during residual spray tests.



on 1-inch steel tubing bent on a large radius 18 inches from the lower end. They were supported in sockets made of 1-inch standard pipe. The booms were tied together with lightweight link chain to prevent sag and were tied to the front of the rig to prevent backward swing. This unit improved the applicator's maneuverability within corrals and over fences by preventing the hoses from snagging on posts as the sprayer progressed along a feed or work alley. Surfaces were sprayed to the point of run-off, and precautions were taken to prevent spray contamination of water and feed troughs and of the animals.

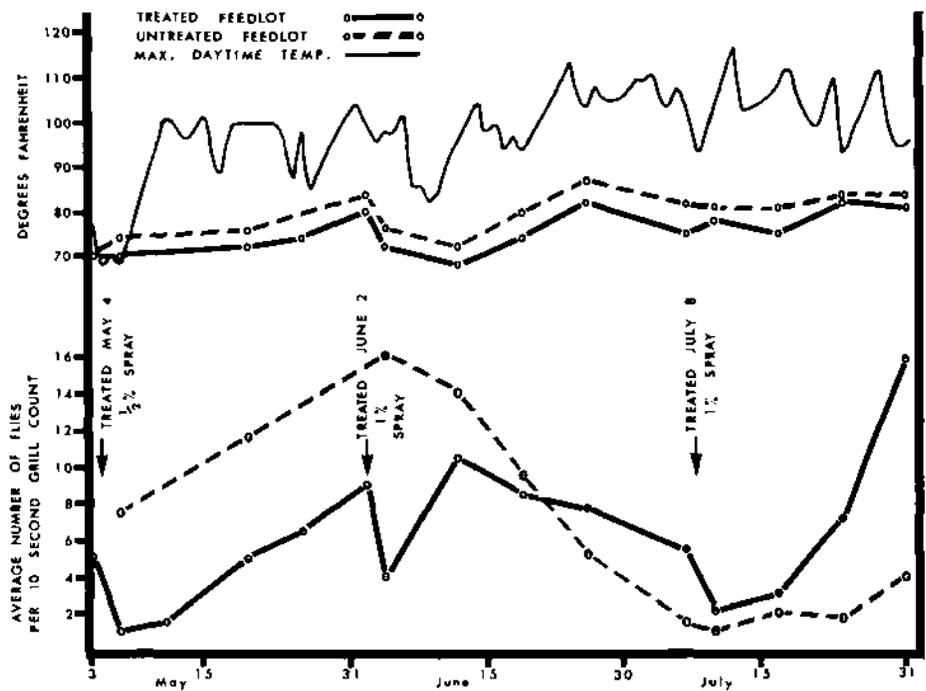
Fly population levels

Several methods used for determining fly population levels included sticky tapes, bait pans and the Scudder "Fly Grill." Windblown material and dust adhered to the tapes and contaminated the bait pan attractants, thereby making these methods unsatisfactory. The Scudder "Fly Grill" worked very well when placed horizontally on a sunlit area of ground in the center alley of the feedlot for a count of the number of flies resting on the grill during a 10-second period. The grill was then placed in a similar area further along the alley (see photo) and the counting process was repeated until 10 replicated counts were made. When the fly density was low, 20 replicated counts were taken. Fly density was measured by the average number of flies per grill.

Fly counts were made in the absence of wind and at approximately the same time of day (6:30 a.m. \pm 15 minutes on feedlot B, and 7 a.m. \pm 15 minutes on feedlot A). Air temperature was recorded each time grill counts were made and averaged 75° F on feedlot B (range = 66° to 82° F) and 79° F on feedlot A (range = 70° to 84° F). All counts were made prior to the morning feeding of the steers to avoid dense populations congregating near newly deposited feed.

Fly population levels on the two feedlots from May 4 to July 21 are shown on the graph. The 0.5% spray treatment applied on May 4 suppressed the fly population for two weeks. During this period, the maximum daytime temperatures had increased to a level of 100° F. In addition, the grill counts indicated a steady increase in fly population density. The concentration was increased to 1.0% for the second and third spray treatments in case Diazinon might break down at high temperatures and with the hope that fly suppression might be extended beyond two weeks.

FLY CONTROL WITH DIAZINON RESIDUAL SPRAYING AS COMPARED WITH UNTREATED FEEDLOT



Lower dosage effective

The 1.0% treatments applied on June 2 and July 8 suppressed the fly population for approximately one and two weeks, respectively. Thus, no additional benefits were gained by increasing the concentration of the material. It should be noted that daytime temperatures over 100° F at the time of the second treatment probably were not responsible for the short duration of fly suppression (one week) since the fly density was reduced for a period of two weeks after the third treatment when maximum daytime temperatures ranged from 104° to 117° F. It appears that the duration of fly suppression may be dependent upon population density because the number of flies was considerably higher at the time of the second spray treatment where fly suppression lasted only one week.

Also of interest was the natural decline in fly density on the check feedlot during June and the first part of July. This decline matched a shorter but similar occurrence in the fly density on the treated lot during this period. No direct cause was found for these decreasing fly densities, since both feedlots continued normal operations throughout the test.

Economically feasible

Satisfactory fly control on cattle feedlots in this area and possibly in other regions is economically feasible. The cost per treatment of the 1,500-head capacity feedlot using a 0.5% spray of Diazinon

totaled \$61.25. This cost was for material (Diazinon 50% wettable powder, \$50.00) and labor (for three men working three hours at \$1.25/hour) and does not include travel time nor depreciation costs of equipment used.

Resistance

Other workers have shown that the housefly has become resistant to Diazinon in certain areas and, in the process, has become cross-resistant to a number of other chemicals used for fly control.

Tests were conducted at the University of California at Riverside to learn if the population of houseflies on feedlot B had developed any resistance to this compound. Houseflies were collected before and after spray treatment of the feedlot and brought to the laboratory to test their level of resistance to Diazinon as well as to DDT, Korlan, Dimetilan, Cygon, dieldrin, malathion and Baytex (fenthion). The results showed that the three applications of Diazinon did not result in any significant increase in resistance to Diazinon or to the other chemicals listed above with the exception of a slight increase in resistance to DDT.

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