



Poultry droppings were kept in metal containers inside screened enclosures seen in photo until all emerging adult flies were trapped in container at the top of the cage, and killed by exposure to an insecticide-impregnated strip of cloth.

Tests conducted over a three-year period show that a dust made from Diazinon 50% wettable powder and agricultural gypsum will successfully kill domestic flies on poultry ranches. Best results were obtained when the dust was applied at weekly intervals to droppings beneath the poultry cages of commercial layer houses. These treatments gave good control of the little house fly (*Fannia canicularis*) and the false stable fly (*Muscina stabulans*), but failed to control the house fly (*Musca domestica*).

FLY CONTROL on poultry ranches in California is almost a statewide problem. The accelerated growth of the poultry industry, coupled with the rapid increase in human population, has created serious nuisance problems in the urban-rural fringe of major metropolitan areas. One of the more critical of these is the control of domestic flies. Of some ten species of flies in the domestic fly complex, three species are of common concern to poultrymen: the house fly (*M. domestica*), the little house fly (*F. canicularis*), and the false stable fly (*M. stabulans*).

Frequent removal of manure from the ranch and delivery to the field, where it is disked under for fertilizer, has been a partial solution to this fly control problem. This practice is not used extensively however, because of high labor costs, the seasonal use of manures, long hauling distances, and lack of adequate storage sites. For these reasons, many poultry-

men depend on routine applications of insecticides to their buildings and to the manure for control of flies.

Water mix

One of the insecticides in common use on poultry ranches is Diazinon. It has been used extensively for fly control since 1958. Both USDA and the University of California recommend this insecticide, mixed with water, for use as an adulticide as well as a larvicide. In recent years, southern California poultrymen have mixed Diazinon with other carriers (such as agricultural gypsum and weed oil) in an attempt to reduce the further wetting of the manure through the addition of insecticides mixed with water.

During the spring of 1962, tests were conducted on a typical southern California poultry ranch to determine the larvicidal effectiveness of: (1) Diazinon emulsifiable concentrate (EC) when mixed with water; (2) Diazinon (EC) when mixed with weed oil; and (3) Diazinon wettable powder (WP) when mixed with agricultural gypsum. Application of each combination was made to the manure beneath the cages at various intervals. Fly control was evaluated using a scoring system. Excellent control of *Fannia* species was obtained, but control of the house fly appeared less clearly defined. The gypsum combination gave the best fly control and was the least expensive of all combinations.

In 1963, another test was conducted to further investigate this procedure—using actual counts of larvae instead of the scoring method used in the 1962 test.

Diazinon Dust

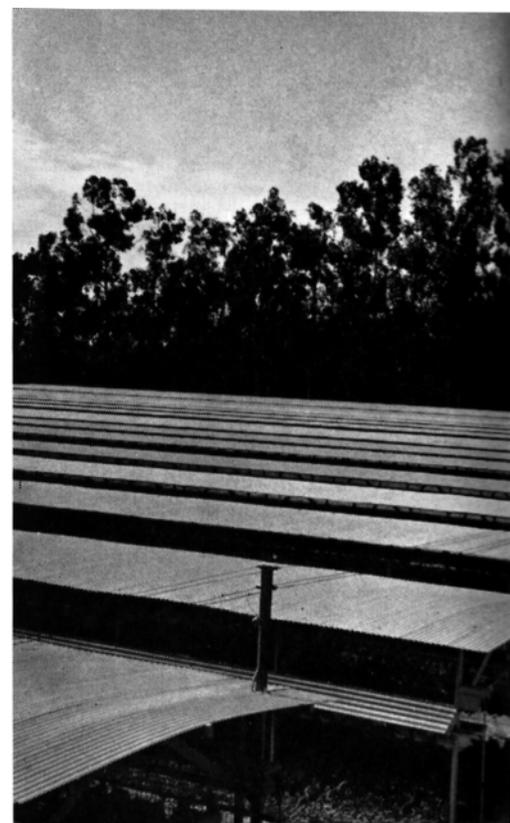
FOR FLY CONTROL IN POULTRY MANURE

This test gave similar results but also emphasized the need for adult emergence counts rather than larval counts. The mere presence of fly larvae in the manure did not necessarily mean that they would eventually emerge as adults.

Ranch tests, 1964

In the spring and summer of 1964, further tests were conducted on two poultry ranches in Orange County. At the Grimm Ranch, there were approximately

Single-aisle cage houses seen in photo below were where fly control testing was conducted.

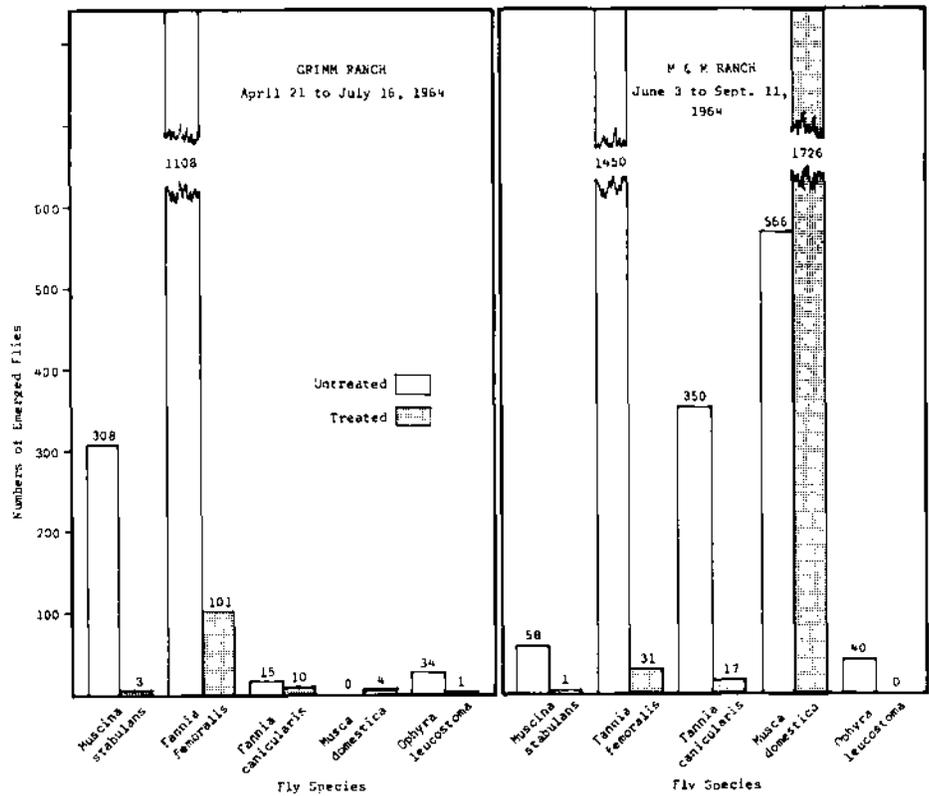


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CONTROL TURE

20,000 laying hens, and at the M & M Ranch, about 8,000 hens. At both ranches the birds were housed in single-aisle cage houses, as shown in the photo. The manure which accumulated beneath the cages was removed two to three times a year at these ranches (a common practice throughout the industry).

A 1.25% insecticide dust was prepared by mixing 1 lb of 50% Diazinon WP with 39 lbs of agricultural gypsum. Using a metal flour sifter, the dust was evenly



FLY CONTROL WITH 1.25% DIAZINON AND GYPSUM DUST APPLIED WEEKLY TO MANURE BENEATH CAGED CHICKENS ON POULTRY RANCHES, ORANGE COUNTY—1964

applied once weekly at the rate of 4 lbs per 100 sq ft of manure surface. The treated plots were from 40 to 50 sq ft in size and represented manure from 80 to 100 hens. Each treatment was replicated four times, and four untreated plots were used for comparison.

Plot sampling

On both ranches the plots were sampled biweekly for the eight-week duration of the test. Each sample consisted of four cores of manure, each measuring 3 inches in diameter by 5 inches long. These were placed in an open metal container inside a screened emergence cage, 1 ft square by 2 ft high (see photo). Samples were maintained in this manner on the ranches until virtually all adult flies had emerged—four weeks on the Grimm Ranch and six weeks on the M & M Ranch. Manure samples were held for six weeks on the M & M Ranch, because data from a somewhat similar experiment conducted concurrently showed that a longer period was required for complete emergence of all flies, but particularly for *F. canicularis* and *F. femoralis*.

As adult flies emerged from the samples, they moved upward and were collected in a small plastic container on top of the cage. Collection of flies within the plastic container was facilitated by using a small strip of material impregnated with a quick knock-down insecticide for

killing the flies and preventing re-entry into the cage. At the end of the emergence period the dead flies were removed, counted, and identified.

The results showed percentage of control was similar in both tests (see graph). The biweekly counts showed fly control averaged 99% for *M. stabulans* (range: 98 to 100%), 95% for *F. femoralis* (range: 43 to 100%), 93% for *F. canicularis* (range: 0 to 100%), and 99% for *Ophyra leucostoma* (range: 83 to 100%). Control of *M. domestica* was not obtained at either ranch. The lack of control of *M. domestica* apparently resulted from resistance to Diazinon. An example of a 16½-fold resistance in adult *M. domestica* to Diazinon was determined from house flies collected on an Orange County poultry ranch where Diazinon had been used routinely as a larvicide for the past three years.

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Typical of egg ranch hen housing in Orange County where Diazinon was conducted.

