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G77-355 A Guide for the Control of Flies in Nebraska Feedlots and Dairies (Revised March 1990)

John B. Campbell

University of Nebraska - Lincoln, jcampbell1@unl.edu

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A Guide for the Control of Flies in Nebraska Feedlots and Dairies

Flies, especially stable and house flies, can create serious and costly problems for feedlot and dairy operations. This publication describes several methods for control.

John B. Campbell, Extension Entomologist

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Several species of flies may be in confined livestock facilities during summer. The stable and house fly are the most serious pests. Blow flies also may be present if molasses is in the diet. Horn flies--small blood-feeding flies--may be present in early spring. These flies overwinter as pupae in or near manure pats in range or pasture. If cattle are not present in the grassland when horn flies emerge, they will migrate to confinement cattle. Normally, a second generation of horn flies does not develop in confined units because cattle trample the manure, preventing the flies from developing.

Stable Flies

Stable flies are dark colored, 3/4-inch long, and have piercing bayonet-like mouthparts that extend from under their head. They resemble the common house fly except for the mouthparts and the "checkerboard" markings on the underside of the abdomen. They have the typical complete metamorphic life cycle (egg, larva [maggot], pupa, and adult) with each stage being different in appearance. Their life cycle is about three weeks in summer and longer in cooler weather. Females deposit 400 or more eggs during their life. Stable fly development may occur in any wet, decaying organic matter, but primarily occurs in animal waste mixed with soil, straw, hay, silage or haylage and grain. Thus, the feedlot or dairy often provides ideal fly breeding media. Stable flies also may deposit eggs in grass clippings, post-harvest refuse, mismanaged compost piles, fermenting vegetation along

waterways, hay or straw stack butts, winter beef herd feeding grounds, and dairy calf hutches (particularly during wet years). Stable flies probably overwinter in breeding areas below the frost-line as slowly developing larvae.

Stable flies feed on most species of domestic livestock, but are major pests of cattle and horses. They penetrate the animal's skin with their piercing mouthpart and feed on blood. They primarily feed on the front legs, causing cattle to bunch in a circle with each animal trying to protect its front legs.

The economic losses for feeder cattle, even at low stable fly population levels, are dramatic. They range from 0.1 pound to 0.48 pound per head per day decreased weight gain, depending on fly numbers. These losses are particularly acute when heat stress also occurs. The bunching behavior of cattle when fed on by stable flies adds to the stress. Dairy milk production can be decreased by as much as 40 percent by high numbers of stable flies.

House Flies

House flies are similar in appearance to stable flies and develop in similar material. In fact, they often are found developing in the same material. The house fly also will develop in fresh manure. Because house flies have sponging mouthparts, they cannot pierce the skin of an animal. Instead, they feed on animal wastes, decomposing feeds, and other liquified organic matter. The life cycle of the house fly is about two weeks.

The economic impact of house flies is not well-documented. They have been incriminated in the transmission of many animal and human diseases. Animal production losses from house flies have not been proven, but high numbers around feed bunks reduce the number of cattle visits to the bunks. In addition, high population levels will cause bunching.

Lawsuits

House and stable flies are considered together in nuisance lawsuits. This litigation usually cites dust, odors, and flies as a complex without identifying fly species. The urban expansion in agriculturally zoned areas has increased the possibility of lawsuits thus bringing about higher rates for liability insurance. If lawsuits are settled in favor of the claimant, the settlement requires either punitive damages or cessation of livestock production.

House and Stable Fly Control

Management

Control of insects economically and without undue harm to the environment or the agricultural commodity can be defined as "employing good management practices that reduce insect populations while at the same time increasing agricultural production." Employing sanitation, cultural practices, and judicious use of insecticides can be defined as good management.

Sanitation

Effective house fly and stable fly control cannot be achieved with insecticides alone. Proper animal waste management and good feedlot sanitation must be included in a fly control program. Feedlots and dairy facilities should be designed or modified to facilitate ease in cleaning, good drainage, and to

minimize waste accumulation.

The major fly producing areas include: behind feeding aprons, under fences and gates, along and behind mounds, bedding in sick pens, along drainage areas and debris basins, around potholes (low areas), dairy calf hutches, old stack butts, in silage and haylage drainage areas, along and under feed bunks, in feed storage areas, in winter feed grounds for beef herds, and around leaky waterers.

Cleaning pens in the spring, when cattle are sent to market, and in the fall will prevent excessive accumulation of fly breeding material. In addition, scraping behind the feed apron and along drainage areas at two-week intervals will reduce fly breeding. The material need not be removed if it is spread out in a thin layer to facilitate drying. Later, the material can be incorporated into mounds or used to fill pot holes or low areas.

Cultural Control

Maintaining dry conditions in the feedlot or dairy pen will greatly reduce fly breeding since flies need moisture mixed with organic matter to develop. Dragging the pens reduces moisture and fills low areas. Some operators drag the pens with a harrow; others make drags out of old road maintainer blades.

The pens should have enough slope to provide good drainage. The slope on drainage areas should be 3° to move water rapidly to the holding ponds. It should be uniform enough to prevent puddling.

Pens should be stocked at a rate that causes trampling of the waste. This enhances drying and prevents fly development. When cattle are removed, clean the pens. If the manure cannot be spread on fields, make sure stored manure is stacked with steep sides and packed so water cannot penetrate it. Covering the edges of stored manure--where drainage may be occurring--will make the fly breeding material too hot for flies to survive. This method also can be used around the edges of silage and haylage piles where seepage occurs.

Vegetation around lots provides shady resting areas for flies. Keeping weeds and grass mowed restricts the area inhabited by flies and makes sprays more effective.

If fly breeding is occurring in drainage areas and debris basins which are too wet for the use of cleaning equipment, flood these areas with irrigation water occasionally. One-half inch of water on fly breeding areas for a few hours will drown fly larvae.

Insecticides

For specific insecticide recommendations see EC 89-1550, "Nebraska Management Guide for Control of Arthropod Pests of Livestock and Horses." All insecticides are poisonous and should be used with caution. Concentrated insecticides are especially dangerous. Some insecticides are registered for use on both crops and livestock. Use only products registered for use on livestock. Products registered for use on crops may be mixed with a carrier that would cause skin burning or be otherwise toxic to animals. Read and understand all use precautions, restrictions, treatment ages, treatment frequency, treatment-slaughter intervals, and other label warnings.

Insecticides can be applied for fly control in several ways. The application methods include space or area sprays, residual sprays, feed additives, baits and larvicides.

Space or Area Sprays: This method is the application of low concentrate, short residual sprays into fly-

infested areas. Mist blowers, foggers, hydraulic sprayers, and aircraft may dispense the insecticides. Proper application of area sprays results in quick knockdown of house and stable flies. There is little residual value with these sprays, so if the droplet does not hit the insect, it soon decomposes to nontoxic status. An area spray should cover all of the cattle pen area and include fly resting areas in and around the pens (windbreaks, tree lanes, weeds, and even the fringes of crops close to the pens). An application of an area spray to a windbreak during the heat of the day may be more effective than spraying around the pens because flies use vegetation for shade. Sprays should be applied the day they are mixed because they deteriorate. Area sprays are often high concentrates (25-50%) so care should be taken in mixing a spray to the proper dilution (0.15-1.0%).

Residual Sprays: Hydraulic or compressed air sprayers can be used to apply residual insecticides to areas where flies rest and will absorb lethal doses of the insecticide residue.

Stable flies and house flies use different resting areas. For control of stable flies, apply residual sprays to the shady sides of fences, feed bunks, buildings and windbreaks because stable flies rest in shade after feeding.

House flies rest in sunny areas until the heat of the day when they move to shady areas. At night they move into buildings on the walls and ceilings or under the eaves. Stable flies seldom enter buildings and generally avoid darker areas.

Residual sprays are effective for 7-10 days if not exposed to sunlight or washed off by rain. The spray should be applied to the point of run-off but not allowed to puddle. Care should be given to avoid contamination of feed or water. Insecticides should be rotated periodically to avoid developing insecticide resistance. Ideally, the rotation would be among different families of chemicals (i.e., a chlorinated hydrocarbon, a phosphate and a pyrethroid).

Larvicides: Applying insecticides to fly breeding areas to kill fly larvae generally is not recommended. The chemical and physical nature of the manure and other materials in the breeding areas cause a rapid breakdown of the insecticide. There also is a much greater chance for the development of insecticide resistance when the immature fly population is exposed to these treatments.

However, under some conditions, larvicides may be the only workable solution. Fly breeding areas that are too wet for the use of cleaning equipment may have to be treated with sprays to reduce fly populations. The same is true of stored manure that has been penetrated with moisture.

Baits: Baits are useful only for house flies or blow flies. Stable flies feed only on blood and are not attracted to baits. There are commercially available baits in dry or liquid forms. Residual insecticides suitable for use around livestock can be mixed with sugar and used as baits. Baits should be applied only in locations inaccessible to animals or children. Baits can either be applied at bait stations (burlap or paper bags) or mixed with water (slurry) and applied with a paint brush to fly infested areas. Baits and dead flies should be removed at weekly intervals and the bait replaced for best results. Baits will not control a house fly population at a feedlot or dairy, but can reduce numbers in offices, milk parlors and around feed handling facilities.

Feed additives: Some insecticides can be mixed with rations or used in a mineral block and fed to cattle. The insecticide passes through the digestive system of the animal and is then present in the manure to kill fly larvae. Only house flies breed in fresh manure. However, as indicated earlier, house flies also breed in material other than fresh manure. Feed additives are most effective in more arid areas where house flies are far more prevalent than stable flies and where animal wastes dry too rapidly for fly

production.

Biological Control: In recent years, commercial insectaries have reared and sold fly parasites (pteromalid wasps) which deposit eggs on fly pupae. The wasp larvae feed on the developing fly and generally kill it. Under certain conditions, the wasps have been quite effective. However, under conditions at Nebraska feedlots and dairies, they have not proven successful. This is probably because the parasites have not been indigenous to the region. It is possible that parasites eventually will be used in a fly pest management program, but success will require more information on the biology, ecology, searching behavior, overwintering capabilities, species complex, influence of climate, and rearing procedures for the native species.

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