

CHAPTER 10 a

Vector Abatement Plan.

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A vector abatement plan is required by Standards for the Permitting of Agricultural Animal Facilities. The following are the two paragraphs (a.& b.) that discuss the requirements of the law:

R.61-43 200.160.A

1. Normal management practices used at the animal facility, lagoon, treatment system, manure storage pond, and manure utilization areas to ensure there is no accumulation of organic or inorganic materials to the extent and in such a manner as to create a harborage for rodents or other vectors that may be dangerous to public health.
2. A list of specific actions to be taken by the producer if vectors are identified as a problem at the animal facility, lagoon, treatment system, manure storage pond, or any manure utilization area. These actions should be listed for each vector problem, e.g., actions to be taken for fly problems, actions to be taken for rodent problems,

Rodents and flies are directly mentioned as the type of vectors requiring plans. Plans for other vectors may be needed such as those for other insects (darkling beetles, mosquitoes, etc.), other mammals (dogs, muskrats, etc.) and birds.

Management and sanitation are the real keys to preventing or eliminating any vector problems. If these weaknesses are not addressed, the problems will recur. Pesticides are the final tools in controlling the problem.

Most problems with insects, rodents and scavenging animals (dogs, cats, foxes, opossums, racoons, etc.) can be minimized by keeping the facility and surrounding area clean and properly maintained. The following list is an example:

1. Removing all excess building materials.
2. Removal of any excess feed from the houses or around bins.
3. Keeping grass and weeds mowed.
4. Keeping all building free of trash and debris.
5. The proper use and servicing of bait stations.
6. Proper and timely disposal of dead animals.

Facilities with under-pit storage will be drained and refilled regularly to remove solids and prevent their buildup. Any bridging of accumulated solids will be removed immediately. Floors and walkways will be cleaned as needed to remove solids.

Lagoons, storage ponds, pits, and above ground storage tanks will be operated so as to minimize the crusting of solids. Vegetation will be maintained along the banks of the lagoons and storage ponds. Any accumulation of excessive vegetation or decaying vegetative matter should be removed.

Any spillage of feed should be cleaned as soon as possible and all feed will be kept dry. All feed storage covers will be used. Drainage away from all feed storage containers should be provided to reduce moisture accumulation.

Any areas of standing water not related to waste handling should be drained to eliminated drinking water for animals and breeding areas for insects.

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Vector Abatement Plan Suggestions: Rats

Integrated Pest Management Considerations and Recommendations

Livestock and Poultry Facility

1. Utilize and properly maintain in-pen feeders.
 - a. Avoid feeders with an open base and make repairs to damaged feeders which allow harborage of rodents.
 - b. Feeders should be properly adjusted so excess feed does not accumulate in feeder bowl or trough and around the base of the feeder.
 - c. Feed removed from feeders should be properly utilized or discarded
 - d. Unused pens should have all feed removed and feeders cleaned

2. Follow good sanitation practices for manure management.
 - a. Allowing manure to build up and dry out provides shelter for rodents.
 - b. Remove excess manure packs along walls and curtains.
 - c. Clean up any manure that has accumulated along the outside foundation of the building.

3. Separate storage area from livestock rearing areas because storage areas provide hiding places for rodents. The following items provide excellent hiding places and food for rodents:
 - a. Feed and feed bags/sacks
 - b. Old feeders
 - c. Farrowing crates
 - d. Feed grains/other farm products.
 - e. Shaving/ bedding materials/ hay/ straw
 - f. Buckets
 - g. Ventilation fans
 - h. ETC.

4. Maintain good sanitation around the exterior of production facility.
 - a. Keep the perimeter debris free and weed free.
 - b. Do not stack building materials (lumber, roofing, cement blocks, bricks, buckets) in the vicinity of livestock building.
 - c. Remove all old vehicles, abandoned farm equipment, abandoned building and other rubble.

5. Store feed and feed supplements properly.
 - a. Metal feed tanks
 - b. Bagged feed should be evaluated off the floor with baiting stations or traps in place
 - c. In feed storage areas patch holes and clean up spills.
6. Conduct biweekly rodent monitoring programs. This should include all animal production building, feed mills, pump house, and office building.
 - a. Inspection for rodent signs inside and outside building
 - b. Inspection and fill of baiting stations.
 - c. Inspection of and baiting traps (if applicable)
7. Remove and dispose of all dead animals and other biological materials immediately and appropriately.

Lagoon, Waste Storage Pond, and other Waste treatment facilities.

Lagoon and waste storage pond banks should be well maintained. The banks of the lagoon should be mowed closely to eliminate hiding places and food for rodents. The lagoon should be inspected for signs of burrowing and digging by rodents or other wildlife. If signs of problems are found, then identification of rodents or wildlife is essential. Anytime rodents are involved then all of the BMP's for livestock facilities can be applied.

Concrete and metal waste storage tanks are of special concern. While these were not common in South Carolina in 1998, there is a potential for their use in the future. If they are used, there is a need to monitor rodents to prevent burrowing and undermining of the structures.

Solid separators and compost bins could be locations where rodents breed and feed. Sanitation and regular disposal of solids from separators are very important. Proper composting techniques are important to prevent rodent colonies from inhabiting composting facilities. Using best management practices (BMP) to prevent vector problems is the best course of action. If rodents become a problem corrective actions should be taken and the BMP should be closely reviewed and updated to prevent these problems in the future. Waste Management Plans should list specific actions to follow when a vector problem arises, especially on sanitation, removal of weeds, poisoning of rodents and monitoring.

The dead animal temporary storage depositories should not be overlooked as a site for rodent populations. The depository is normally some distance from the main farm and might be overlooked. Dumpsters can have rodent colonies living in conjunction with them.

Disposal of carcasses or body parts into waste lagoons, waste storage ponds, waters of the state, ephemeral and intermittent streams, ditches, or swales is prohibited.

All areas associated with waste handling, transport, and storage should be free of debris and well maintained.

Waste Utilization Areas

Waste utilization areas should present no more of a challenge for rodent control than normal agricultural production areas unless they are mismanaged. If rodents are observed to be a problem, then close observation should identify the problem(s). Corrective measures should be engaged to correct the problem with habitat modification and population reduction measures discussed earlier.

Vector Abatement Plan Suggestions: Filth Flies

Integrated Pest Management Considerations and Recommendations

I. Poultry Facility

A. Facility design and maintenance

1. Before and after building, consider manure management alternatives to reduce fly problems. Consider housing systems designed to dry manure or to keep manure wet so flies will not multiply.
2. Direct surface water away from the building. Drain and fill all low areas around the houses. Clean out weed-choked water drainage ditches. Install proper eave troughs and down spouts to carry rain water away from the buildings. Repair any eroded areas than maybe undercutting the buildings.
3. Provide abundant cross ventilation beneath the cages, especially during hot weather. Thirty-six inch pit fans blowing across the manure are effective. A curtain above the manure every 100 feet to keep air velocity over the manure helps. Adequate house ventilation is important at all times.

B. Integrated Pest management

1. Manage the manure so predaceous mites, fly predators and fly parasites will help control flies.
2. When manure is allowed to accumulate for periods of more than one week, examine the manure for fly breeding areas and be prepared to apply manure insecticide drenches or feed-through insecticides when needed.

C. Insecticides

1. Use fly traps and insecticide bait in localized areas for year-round control of adult flies.
2. Apply residual sprays to adult fly resting areas as needed.
3. Use contact sprays when necessary to reduce adult flies. Automatic systems should be considered when labor is a problem.
4. Be constantly aware of insecticide resistance problems

D. Water Management

1. Prevent leaks in water troughs or cups. Regulating water flow with an on/off cycle may help eliminate the moisture problem. Use drip pans under water troughs if necessary. These pans will divert water from the manure.
2. Prevent dysentery by keeping waterers clean. Recommended antibiotics should be used to prevent dysentery development.
3. Avoid laxative feed rations
4. Avoid excessively high house temperatures that encourage an abnormal water intake

5. Practice good husbandry by restricting excess water consumption
- E. Sanitation is the most important aid in successful fly control. Often, certain conditions in and around the poultry operation will encourage fly outbreaks. They must be eliminated.
1. Remove and dispose of dead birds and broken eggs promptly. Disposal should be far away from the poultry premises and be accomplished by burning in an incinerator, deep-ground burial, through commercial garbage collectors, or composting on at least a weekly basis during the damp, hot, summer months.
 2. Clean up and dispose of feed spills and manure spills, especially if wet.
 3. Reduce feed spills.
 4. Minimize sources from other fly-infested animal operations in close proximity to the poultry house. Poultry Pest Management, Bulletin 853; The Ohio State University

II. Dairy Facilities

- A. Sanitation
1. Remove all manure from livestock pens as frequently as possible. Calf and bull pens with animals in them require special attention. It is best to clean these pens once a week. Clean livestock barns have fewer fly problems.
 2. Spread the manure thinly outdoors so that fly eggs and larvae can be killed by drying, or stack the manure and cover with black plastic.
- B. Facility design and maintenance
1. Eliminate silage-seepage areas, wet litter, manure stacks, old wet hay or straw bales, and other organic matter accumulations that may attract flies anywhere on the farm. Wet feed remaining near the ends of mangers also provide a place for flies to lay eggs.
 2. Provide proper drainage in barnyards. Use clean gravel and other fill to eliminate low spots in livestock yards. Proper drainage tiling can reduce wet barnyards.
 3. Cut weeds and control excessive plant growth around facilities where flies rest and breed
- C. In milk room follow steps to achieve optimum fly control and avoid illegal residues
1. Reduce the number of flies entering the milk room by practicing strict sanitation and using recommended insecticides in dairy barns and around the premises.
 2. Make sure good, tight fitting screens are on the milk room doors and windows. Use screens, 14 to 16 mesh (holes to the inch), made of copper, aluminum, bronze, plastic, or rust-resistant material. Use spring loaded doors and keep them shut at all times. Electric-powered "air-curtain" fans will discourage flies from entering doorways.

3. Use mist or aerosol space spray of 0.06 to 0.1 percent pyrethrins plus piperonyl butoxide oil-based fly sprays when other methods fail to give adequate control. To prevent milk contamination, **cover** milk, milking equipment, can, bulk tank, and other containers before spraying. **Always follow label directions and safety precautions**
 4. Use sticky fly strips where appropriate, such as Lurefly ribbons, Fly Stik with Muscalure, or aluminum foil sticky fly trap paper.
- Ohio Livestock Manure and Wastewater Management Guide Bulletin 604

III. Swine Facilities

- A. Facility design and maintenance
 1. Make the surface water runs away from the building. Drain and fill all low areas around the houses. Grading and drainage around livestock facilities should prevent rain water from entering the manure or feed.
 2. Air circulation should be encouraged by suitable fans and by mowing the vegetation outside facilities.
 3. Clean out weed-choked water drainage ditches. If fly breeding is occurring in a drainage area too wet for equipment to clean the area, flood the area with irrigation water occasionally. One half of an inch of water for a few hours is enough to drown fly larvae in the fly breeding area.
 4. Waterers should be adjusted so there is no spillage or leaking.
 5. Remove excess manure packs along walls
 6. Clean up any manure that may have been accumulated on the outside of the building's foundation.
 7. 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. Keeping grass and weeds mowed or controlled allows more sunlight and air movement in the area. The consequence is faster drying, which reduces the chance of flies completing their life cycle.
- B. Sanitation is the most important aid in successful fly control. Often, certain conditions in and around the poultry operation will encourage fly outbreaks. They must be eliminated.
 1. Remove and dispose of dead animals and/or afterbirth promptly. Disposal should be far away from the swine premises and should be accomplished by burning in an incinerator, deep-ground burial, through commercial renderer, or composting on at least a weekly basis during the damp, hot, summer months.
 2. Cleaning up and dispose of feed spills and manure spills, especially if wet.
 3. Reduce feed spills. Fix feed tank/auger leaks.
 4. Minimize sources from other fly-infested animal operations in close proximity to the swine facility.
- C. Integrated Pest Management
 1. Monitor fly populations
 2. Remove manure on a weekly schedule at least

3. Manage the manure so predaceous mites, fly predators and fly parasites will help control flies.
- D. Insecticides
1. Use fly traps and insecticide bait in localized areas year-round to control adult flies.
 2. Apply residual sprays to adult fly resting areas as needed.
 3. Use contact sprays when necessary to reduce adult fly populations. Automatic systems could be considered when labor is a problem.
 4. Be constantly aware of insecticide resistance problems
- E. Land application strategies
1. Manure should be thinly spread in fields to allow fast drying.
 2. Turn in the manure application as quickly as possible.

Lagoon, Waste Storage Pond, and other Waste treatment facilities.

Lagoon and waste storage pond banks should be well maintained. The banks of the lagoon should be mowed closely to eliminate hiding places. Decaying vegetation should be removed from storage ponds/lagoons. Storage pond/pits/ tanks will be operated so as to minimize the crusting of solids. Agitate and/or pump down storage pond/lagoon or other storage tanks if crust is thick and covers more than 30% of the pond.

While concrete and metal waste storage tanks were not common in South Carolina in 1998, there is a potential for their use in the future.

Solid separators and compost bins could also be locations where insects breed and feed. Sanitation and regular disposal of solids from separators are very important. Proper composting techniques are important to prevent insects from inhabiting composting facilities. Using best management practices (BMP) to prevent vector problems is the best course of action. If insects become a problem, then corrective actions should be taken and the BMP should be closely reviewed and updated to prevent this problem in the future. Waste Management Plans should list specific actions to follow when a vector problem arises, especially on sanitation, removal of weeds, insecticide applications and monitoring.

Should waste be stockpiled more than 3 days, it must be stored on a concrete pad and/or other acceptable means. Also it must be covered with black plastic to prevent fly breeding.

The dead animal temporary storage depositories should not be overlooked as a site for insect populations. The depository is normally some distance from the main farm and might be overlooked. Dumpsters can have insect populations living in conjunction with them. Remove and dispose of dead animals and biological material immediately and appropriately. If a massive die-off occurs, notify DHEC at once.

Disposal of swine carcasses or body parts into waste lagoons, waste storage ponds, waters of the state, ephemeral and intermittent streams, ditches, or swales is prohibited.

All areas associated with waste handling, transport, and storage should be free of debris and well-maintained.

Waste Utilization Areas

Waste utilization areas should present no more of a challenge for insect control than normal agricultural production unless they are mismanaged. Waste that is spread on fallow or preplant cropland should be disked within 24 hours after application.

Any waste that contains fly larvae and fly pupae must be disked into the ground or treated with an approved and effective fly control method.

If insects populations are observed to be a problem, then close observation should identify the problem(s). Corrective measures should be engaged to correct the problem with habitat modification and population reduction measures discussed earlier.

Some of the Information in this document has been adapted from

Poultry Pest Management, Bulletin 853; The Ohio State University
Ohio Livestock Manure and Wastewater Management Guide Bulletin 604

References

Southeastern Sustainable Animal Waste Management Workshop Proceeding; AWARE Team at University of Georgia.

Pork Industry Handbook : Purdue University