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EC99-1551-B Nebraska Management guide for Control of Arthropod Pests of Poultry and Pets

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Nebraska Management Guide for control of ARTHROPOD PESTS

Featuring:

Poultry
Dogs
Cats
Rabbits
Birds
Guinea Pigs
and Gerbils

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Nebraska Cooperative
Extension Service
Extension circular
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# of Poultry and Pets

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Nebraska Management Guide For Control of Arthropod Pests of Poultry and Pets

Precautions

- Always read and understand label recommendations before opening the container, including: preparation, amount to use, how to use and special instructions or restrictions on the label.
- All insecticides can be hazardous to man, animals and birds if not used correctly.
- Note and follow label restrictions for treatment in conjunction with other insecticides or medication in treating sick or stressed poultry or pets and restrictions on age of poultry or pets to be treated.
- Never use insecticides not labeled for use on poultry or pets.
- Observe minimum time between treatment and slaughter for poultry.

Insecticide Formulations

When insecticide rates are discussed, the initials "AI" mean active ingredient. Understand the differences in the insecticide formulations. Dusts (D) may be preferred when only a few birds or individual animals are to be treated or during extremely cold weather. Emulsifiable concentrates (EC) may be mixed with water or fuels. Flowables (F) are thick fluids which are mixed with water. Soluble powders (SP), wettable powders (WP), and water dispersible liquids (WDL) are to be mixed with water. Agitation is necessary to keep SPs and WPs in suspension. Solutions (S) are used as light mist sprays or as prepared pour-ons.

Insecticides listed in this publication are considered safe when used according to label directions. Proper use will not result in illegal residues in poultry or injury to poultry or pets.

Insecticide Application Methods

Sprays: Non-systemic insecticides may be used as sprays for poultry and pets. The spray needs only to wet the feathers or hair coat which requires a spray pressure of only 40 p.s.i. Adding household detergent helps the spray stick to the feathers or hair.

Feed additives: The insecticide gets into the poultry digestive system either by ingestion of feed (oral larvicide), salt or mineral containing the product. The insecticide passes through the digestive system with little absorption and is available in the manure to destroy fly larvae. The feed additives must be consumed at 24-hour intervals to assure manure treatment.

Self-treatment devices: Dust boxes for poultry can be considered self-treatment devices.

Area sprays: Short residual, quick knockdown insecticide sprays applied to an area inhabited by house and stable flies via hydraulic sprayers, mist blowers and foggers are area sprays.

Residual sprays: These are long residual sprays applied to surfaces which serve as house and stable fly resting places.

Baits: Insecticides mixed with a house fly food source (sugar, molasses) serve as bait.

Larvicides: Insecticides applied to house and stable fly breeding areas.

Dips: Dips can be used on poultry to treat the infested part of the bird (vent).

Injections: Insecticide is injected directly subcutaneously into the animal where it circulates in the bloodstream and tissues.

Spot-on-stripe-on: Insecticide is put directly on the animal either in one location or down the back line.

Pill: Insecticide is contained in a pill and after being ingested, the insecticide circulates through the bloodstream.

Wipes: Insecticide is contained in the wipe which is rubbed on the animal.

Shampoos: Insecticides incorporated into shampoo soaps for washing the animals.

Insecticide Recommendations for Insect Pests of Poultry (G78-391)

Poultry production in Nebraska is concentrated primarily in large units in eastern Nebraska. Only a few farmers maintain flocks. As a consequence, the major poultry insect pests have changed in importance from those that directly affect the birds to the nuisance pests such as the house fly and litter beetle.

A pest that has been noted as a problem the last few years is the lesser mealworm, also termed litter beetle. These beetles deposit eggs in clusters in the manure or litter. The beetle larvae molt 6-10 times before pupating. The older larvae often migrate up the building walls and pupation occurs in the insulation. Larval migration causes considerable damage to the insulation.

The lesser mealworm beetle is about 1/4 inch long and reddish-brown to black with longitudinal grooves running lengthways on the wing covers. Larvae are about 1/3 inch long at the migratory stage. They are tan to light brown with slender segmented bodies and have three pair of legs. They resemble wireworms. The life cycle from egg to adult requires about 60 days.

The main economic factor from the beetle is the destruction of insulation. It also can cause losses by consuming poultry feed and serving as a reservoir for fowl pox, E.coli, salmonella, Newcastle disease and avian leukosis. It also is an intermediate host for poultry tapeworms and fecal worms. These beetles, if numerous enough, can also become a public nuisance

if abundant in poultry manure when it is spread on fields. They migrate to surrounding areas which may be in neighboring urban housing. One favorable aspect of the beetles is that they recycle manure, making it unsuitable for fly development and may be a predator of fly larvae; however, the undesirable traits far outweigh the favorable ones.

Beetle control in poultry units is quite difficult. Once noted, the numbers can be monitored either by observation or by distributing traps throughout the facility. Traps can be made from 2-inch schedule 40 PVC pipe cut a foot long. Corrugated cardboard should be placed inside the trap. A rapid rise in numbers of beetles indicates a need for treatment.

One control method is to leave empty houses unheated during the winter. Temperatures below 30°F will kill all stages of the beetle.

The insecticides listed as residual facility sprays are effective if used according to label directions. For best results, the residual applications should be made after the house has been cleaned. Recommended applications are primarily surface sprays, dusts and baits. Dusts can be mixed with litter or applied directly to the floor after cleaning. Dusts or baits may be applied with a cyclone fertilizer spreader, particularly in highly infested areas.

Several species of lice and mites occasionally are serious pests of poultry. These include the brown chicken louse, the chicken body louse and, less often, the large chicken louse, shaft louse, head louse and fluff louse. Poultry lice are not blood feeders, they chew dry skin scales and feathers. The feeding and movement of the lice on the chicken produces enough irritation to cause appetite loss and, subsequently, reduced production and increased susceptibility to diseases.

The most common mites are the chicken mite, Northern fowl mite and scaly-leg mite. Most chicken mites feed at night and spend the day in cracks around roosts, nests and walls. The Northern fowl mites remain on the bird. The chicken and Northern fowl mites feed on blood; the scaly-leg mite burrows into the skin on the lower legs and feet, sometimes crippling the bird.

If left untreated, these mites can reduce poultry production or contribute to mortality, either directly or from increased susceptibility to diseases.

Bedbugs may be pests of poultry, and workers accidentally may carry them to their homes where they become a pest to humans. Bedbugs also feed at night and hide during the day in insulation, wall cracks, loose boards, nests or other dark areas.

The section on house and stable fly control in and near livestock facilities in EC97-1550, *Nebraska Management Guide for Arthropod Pests of Livestock and Horses,* is appropriate for poultry facilities as well. Larger production units, however, must develop a system of fly control based on the type of buildings and production management they are employing. Effort must be made to prevent flies from gaining entrance to manure; care must be taken to keep the manure as dry as possible or move it out of the house to storage before flies start breeding in it.

Chiggers occasionally may be a pest for poultry, particularly turkeys raised under range conditions. Chiggers bore into the skin under the neck, wings and breast or around the vent and legs.

Mites and lice that leave the bird can be controlled by treating the facilities. Those that remain can be treated by sprays or dusts, treating their litter, or by providing dust boxes for self-treatment. Chiggers can be prevented by spraying the range and pens before the birds are pastured.

Turkey range should be treated with malathion at a rate of one pound of 57 percent emulsifiable concentrate in 25 gallons of water per acre prior to pasturing birds. Repeat range spray at two to three week intervals. Treat pens with chlorpyrifos (Lorsban) at a rate of 100 gallons 0.5 percent per acre before birds are penned. Lorsban treatment intervals are four weeks.

Insecticide Control Recommendations for Insect Pests of Pets (G78-412, G84-717)

This guide does not consider the wide spectrum of pets found in Nebraska but primarily concentrates on dogs, cats, rabbits, birds, guinea pigs and gerbils.

Insect pests of goats, llama and buffalo would be similar to those of sheep and cattle and control recommendations would be comparable. There are restrictions on insecticides used on milking goats to avoid milk residues. Smaller animals would have insect parasites similar to those found on dogs and cats.

Fleas, mites, ticks and lice are the most common specific pests of pets. Flies of the filth fly complex also are associated with pets unless strict sanitation and animal protection is provided.

Mosquitoes feed on dogs or any warm-blooded animals. Mosquitoes transfer a variety of diseases or parasites, including heartworm of dogs. Heartworm generally is considered a southern problem, but recently many cases have been reported in Nebraska.

Heartworm (*Dirofilaria immitis*) is a nematode which, if left untreated, can cause death. If detected early, dogs can be successfully treated. Symptoms of heartworm infestation may include difficulty in breathing, coughing, tiring easily, listlessness and weight loss.

Immature heartworms are transmitted by mosquitoes when they feed on an infested dog and then later feed on a non-infested dog. In the initial phase of infection, the larvae migrate through body tissues for about three months, then enter the heart valve where they develop into adults.

Adult heartworms are white and may be six inches or longer. They live in the right side of the heart and adjacent blood vessels. There may be 100 or more infesting the dog. This number will impair blood circulation which results in damage to the dog's heart, lungs, liver and kidneys.

Veterinarians treat dog heartworm with carefully administered injections of an organic arsenical drug. The worms die, are carried to the lungs by blood

Insecticide recommendations for application to poultry infested with lice, mites or chiggers

Insecticide	*Application method*	*Rate*	*Restrictions and comments*
Carbaryl (Sevin)	Dust	5% AI, 1 lb/100 birds	Dust must reach skin. Treatment-slaughter interval, 7 days. Treatment interval, 4 weeks.
	Dust box	5% AI 2.5 lbs/50 birds	
Malathion (Cythion)	Spray	0.5% AI, 57% EC 1 fl oz/bird	
		Dust (in litter)	4% AI, I lb/500 sq ft
Permethrin (Ectiban) and many other brand names	Spray	0.05% AI, 5.7% EC 1 gal/100 birds	
Stirofos (Rabon)	Spray	0.5% AI, 24% EC 1 gal/100 birds	Treatment interval, 13 days.

Insecticides recommended as residual facility sprays for poultry insect control

Insecticide	*Application method*	*Rate*	*Restrictions and comments*
Carbaryl (Sevin)	Spray	0.5% AI, 50% or 80% WP	Treat surface indicated by label for pest to point of run-off.
Malathion	Spray	1.0% AI, 57% EC	Do not contaminate feed or water.
Stirophos (Rabon)	Spray	0.5% AI, 24% EC	

where they lodge in small blood vessels. In time, they decompose and are absorbed. Veterinarians, in areas where heartworm is prevalent, may implement preventive measures during the mosquito season with either a daily dose of diethylcarbamozine (Filaribits, Pet Doc) or a monthly dose of ivermectin (Heartgard).

Cats are sensitive to some insecticides. Make sure cats are listed on the label before using. There are also a few products registered for cats but not dogs.

As is true for horses, many of the insecticides recommended for use on pets are formulated by companies specializing in pet products. Commonly used livestock insecticides are sold for pet use under a variety of trade names. Insecticide treatments for animals include sprays, dips, dusts, foams, shampoos, collars, pills, wipes, spot-ons, stripes-ons and injections.

Mites (usually host specific) parasitize almost all species of animals. The infestation site is termed "mange." The site is unkempt, painful and irritated as a result of mites burrowing and feeding. Mites are spread by animal contact.

Some species of mites burrow deep into the ear canal near the eardrum. Infested animals scratch or rub their ears and may run in circles or show other evidence of nervous disturbance. The hair follicle mite burrows into hair follicles and causes lesions at the infestation site from secondary bacterial infection.

Control of burrowing mites usually requires repeated applications of an insecticide. The ear mite may require removal of debris from the inner ear before treatment is successful.

Fleas attack pets, including birds, livestock and people. There are several species of fleas, all with similar life cycles. The most common is the cat flea. A generation may be completed in a month. The larvae are white, legless and worm-like. Pupation occurs in a silken cocoon. Adult fleas are small, wingless, hard-bodied and compressed from side-to-side. Their jumping ability makes them highly mobile.

The flea bite is painful, and some flea species are reservoirs for transmission of bacterial, viral and protozoan diseases and tapeworms. Control measures should be directed to the premises occupied by the pet and the pet itself, in conjunction with sanitation.

The cat flea is by far the most important flea species infesting cats, dogs and other pets in Nebraska. Some pet owners complain that regardless of the product or treatment method they can't seem to get rid of the fleas. Usually the infested animals roam outdoors and may get reinfested from raccoons, opossums or other wildlife which may be present even in city environments.

Flea and tick control for pets is a big business for which many animal health companies have developed products. These products are applied as pills, dusts, sprays, dips, spot-ons, stripe-ons, wipes, injections and in pet collars. Sprays, dusts and aerosols are used to dispense the products in carpets and outside.

In recent years, several new products have been labeled for flea or flea, tick and mosquito control. Several are available only through veterinarians; some can be used only on cats and others only on dogs. A

product may include both a standard insecticide and an insect growth regulator (IGR). IGRs are either chitin inhibitors or juvenile hormone mimics. Chitin inhibitors prohibit chitin formation either in the egg stage of flea development or when the larvae molt which causes the death of the organism. Juvenile hormones affect the insect primarily in the pupal stage when the insect is supposed to change from the larval form to an adult. IGRs do not kill adult insects, so an adult insecticide may be added to the formulation. Trade names for new IGRs include Farnam Bio Spot, Zodiac Powerspot, Hartz Onespot and Novartis' Program. Chemical names of these IGRs are methoprene, fenoxycarb and pyriproxyfen.

Some new insecticides have modes of action different from the standard choline esterase inhibitors of the phosphate and carbamate insecticides. These include fipronial (trade name, Front Line – Top Spot) and imidadoprid (trade name, Advantage). Fipronial interferes with the passage of chloride ions which disrupts the central nervous system and kills the insect. Imidocloprid is a new formulation of an old insecticide, nictotene (chloronicotinyl), which although not an acetylcholine inhibitor, acts on nerve ganglia and synapse much like the acetylcholine inhibitors do.

Because flea infestations have been difficult to deal with, veterinarians and entomologists have developed an integrated pest management program. The program includes treatment of the animal and its environment. If the pet is indoors, sanitation is vital to control. Vacuuming carpet, rugs or other cloth areas will help control fleas by removing eggs and dried blood which the larvae feed on. This opens the nap of the carpet for more effective insecticide treatment. Studies indicate that a flea infestation consists of 5 percent adults, 10 percent pupae, 35 percent larvae and 50 percent eggs so a control or prevention program should include daily vacuuming in addition to insecticide treatments.

The pet should be treated with some flea product in conjunction with the indoor habitat treatment. Ideally, the treatment could consist of a mixture of an insect growth regulator to kill the egg or immature forms and an insecticide that will kill adult fleas as well. If pets are allowed outdoors, take steps to reduce flea numbers in the outdoor environment. Trim lawns and weeds, fence yards, discourage nesting of rodents and treat pet areas with an insecticide.

In addition to the products discussed or listed in the tables, there are 15 containing pyrethrins that can be used as room or pet sprays; 10 containing the synthetic pyrethroid permethrin which is often used in conjunction with an insect growth regulator for animal treatment or room or premises treatment; and at least six other similar pyrethroids. The organophosphates include: 1) chlorpyrifos (Dursban) which can be used as a room fogger, dip, dog collar and spray; 2) stirofos (Rabon) is available in a collar as is amitroz (Preventic); 3) carbaryl (Sevin) can be used as a powder on animals and as a premise treatment primarily for tick control.

Three tick species feed on pets in Nebraska. These are the Rocky Mountain wood tick which transmits Rocky Mountain spotted fever and may cause tick paralysis, the American dog tick which also transmits Rocky Mountain spotted fever, and the brown dog tick. This latter one is also a vector of diseases, none of which are endemic in Nebraska. All of these species are three-host ticks. They start with small rodents or animals and eventually parasitize cattle, horses or other large animals.

Flies are pests of pets kept outdoors. The same control measures listed for livestock facilities will suffice to reduce fly populations around kennels or other pet facilities. Stable flies feed on the ears of dogs, particularly German shepherds and greyhounds. Treating dogs' ears at least weekly will provide some protection.

Insecticides recommended for insect control on pets

Insecticide	*Application method*	*Rate*	*Restrictions and comments*
Benzene Hexachloride (BHC) (gamma isomer of Lindane)	Spray	0.06% AI, 20% EC	Do not use on cats. Do not use on nursing pups or lactating dogs.
Carbaryl (Sevin)	Dust or powder	3.9% AI, Dust 5% AI, Powder	Dust entire animal. Do not use dust on nursing puppies. Do not powder puppies under four weeks of age.
	Collar	16% AI	Do not use on puppies under six weeks of age or on sick or convalescent animals.
	Aerosol can	0.5% AI mixed with 0.05% pyrethrin Spray 20-30 seconds For 25 lb. dog	Do not let spray contact eyes or scrotum. One week treatment interval.
Chlorpyrifos (Dursban)	Spray	0.225% AI Ready to use	Do not use on nursing dogs or pups under 10 weeks of age.

Insecticide	*Application method*	*Rate*	*Restrictions and comments*
Chlorpyrifos (Dursban) (continued)	Dip	3.84% AI, 50% EC 30 seconds in dip	Do not use on nursing dogs or pups under three months of age.
	Collar	8.0% AI	Do not use on dogs under 12 weeks of age or on sick or convalescent animals.
Cythioate (Proban)	Feed additive	1.6% (oral liquid) 1 ml/10 lbs body wt. Two applications/week	
		30 mg tablets 1 tablet/20 lb body wt. Two applications/week	
Diazinon	Dip	0.15% AI, 5% EC	
Malathion + Benzene Hexachloride	Sponge	0.3% AI, 18% EC	
Malathion + Methoxychlor	Spray	0.5% AI, 40.8% EC	Do not use on cats.
Methoxychlor + Pyrethrins + piperonyl butoxide	Powder Ready to use	3.16% AI	Do not use on nursing kittens or kittens under four weeks of age.
Naled (Dibrom)	Collar	15.0% AI + 4.2% AI Propoxur	Do not use on cats.
		7% AI + 2.4% AI Propoxur	Okay for cats.
Propoxur (Sendran)	Collar	9.4% AI	Do not use on sick or convalescent dogs. Do not use in conjunction with other insecticides.
	Dip	0.125% AI	Do not treat nursing animals under one month of age.
	Shampoo	0.25% AI	
	Aerosol	0.25% AI	
Pyrethrins	Aerosol	0.09% AI Ready to use	Bird spray.
Pyrethrin + piperonyl butoxide	Spray	0.05% AI	

Insecticides recommended for outdoor premise treatment for pets

Insecticide	*Application method*	*rate*	*Restrictions and comments*
Carbaryl (Sevin)	Dust	0.25-0.5% AI 1 lb/5000 sq ft	Do not expose kittens under four weeks of age to treated areas.
		5% AI 8 oz/100 sq ft lawn	Keep pets and children away until grass is dry.
Chlorpyrifos (Lorsban) (Dursban)	Spray	0.5% AI, 6.7% EC	
Naled (Dibrom)	Dry bait (flies)	36% AI 1 tsp/1 lb sugar	
	Wet bait	0.06% AI, 36% EC	

This publication does not supersede label information. Always read and carefully follow the instructions on the container label. For current information, contact your local Cooperative Extension Office.
The use of trade names in this circular is not an endorsement by Nebraska Cooperative Extension.