

For Poultry...

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Insect and Mite Control

By DONALD C. CRESS
EXTENSION SPECIALIST, ENTOMOLOGY

Materials and rates of application listed are based on the latest information available at the time this publication went to press. Supplemental information will be disseminated as the need arises, usually through the offices of county agricultural agents.

All insecticides are poisonous in varying degrees. They should be handled cautiously so that they will not poison livestock, children, or the user. Read the label on the package carefully for instructions on how to use all insecticides.

Note: The information in this bulletin is for use on chickens, turkeys, and other barnyard fowl. Because of the dangers of off-flavoring eggs and contaminating meat with insecticides, follow all label directions for use of chemicals around poultry. Especially, do not use insecticides that are not listed in this bulletin, or are not approved on up-to-date package labels. Stop treatments the required number of days before slaughter of birds.

Lice and mites may reduce egg production. Birds go off feed, become droopy, develop diarrhea, or often die. *Note:* Common chicken mite control is very similar in most aspects to that for poultry lice and northern fowl mite. The essential difference, of course, is that lice and northern fowl mites are on the birds all the time and the common chicken mite only when they feed for blood, usually at night. Hence, control must be done primarily on the birds for lice and northern fowl mite and throughout the building and equipment for common chicken mite. Consequently, common chicken mite, northern fowl mite, and poultry lice control should be planned as a single project.

For, whatever is done about one pest will help control the others.

Northern Fowl Mite

The adult northern fowl mite is small ($\frac{1}{16}$ inch long); its body is oval to elongate and has eight legs. The adult is usually blackish-brown, although color variations sometimes give it a banded appearance. The eggs are usually deposited on the birds. These mites may be found on the birds at all times. Control measures should be taken when these mites are seen on the birds, or in the nests.

Common Chicken Mite

The adult mite is about $\frac{1}{5}$ inch long and has eight legs. It is grayish, but when filled with blood, it is red to nearly black. The chicken mite lives in wood cracks and other hiding places in, and around, poultry houses. It visits chickens and other fowl only when feeding. Common chicken mites are usually found on the birds only at night. Control measures should be taken when these mites are seen (most abundant in the summer) in the poultry house or during general fall and spring clean up.

Poultry Lice

Several kinds of lice bother poultry by chewing feathers and skin scales. No sucking lice infest domestic fowl.

Poultry lice are wingless, flat bodied, six-legged, and have a rounded head in front. When full grown, some are $\frac{1}{8}$ inch long and vary in color from gray, to yellow, to black. Lice live their entire life on the birds and deposit their eggs on the feathers. Control

measures should be taken in the spring and fall or when the lice are bothering the birds.

Beetles, Grain Mites, and Fly Maggots

In recent years, deep litter has created a number of new mite and insect problems in poultry houses. Two conditions are mainly responsible: first, high organic content and secondly, abundant grain-food supply found in this type of litter.

Normally, control of these insects requires removal of the litter and thorough cleaning of the floors and at least the lower-half of the walls. Only after this has been done, should an insecticide be used. Apply the treatment to the bare floor and walls.

Wire Cages or Batteries: Nowhere in the production of poultry is sanitation as important as when birds are housed in wire batteries (cages). Floors and areas around the legs or stands of the cages must be kept free of litter and other materials that harbor common chicken mites.

Flies in Poultry Houses

No fly control program can be successful unless larval development in droppings can be prevented. Flies may come into poultry houses from distances of 2 or more miles. When heavy fly populations are observed in untreated areas, it is time to take immediate action to reduce the fly population by use of fog or space sprays. Treatments should be repeated as needed.

Sanitation

Cleanliness in poultry houses is a must at all times for control of mites, lice, and other insects. *A thorough cleaning and elimination of insects and mites before housing a new flock in the fall will greatly reduce the annoyance created during the winter by these pests.*

- (a) Remove manure from beneath caged layers as frequently as feasible.
- (b) Scatter manure lightly outdoors so that fly eggs and larvae can be killed by drying. *Avoid piling manure, as it will create a fly breeding site.*
- (c) Remove floor litter, droppings, and nesting materials at regular intervals.
- (d) Maintain low moisture levels in the manure by proper ventilation. Repair or replace leaking water troughs, individual water valves, or other faulty fittings. Dry manure is less suitable as a fly breeding site.

Mechanical

Use a fan to blow air through a screened doorway from the egg room or other work areas into the main poultry house. Flies will not move against the wind into the egg room or other work areas.

Baits

Never use baits where loose birds are housed. Scatter bait where flies rest on floor areas not satisfactorily treated by sprays. **Follow label instructions and precautions on use of baits.**

Residual Sprays

- (a) Apply a 1% dimethoate residual spray (1 gallon of 23.4% EC in 25 gallons of water) to ceilings, walls, etc., to the point of run-off. Apply one gallon of spray to 500 to 1,000 sq. ft. of surface. Be sure to *remove birds from the building before spray application.*
- (b) Apply a 1% ronnel (Korlan) residual spray (1 lb. of 25% WP or 1 pint of 24% EC in 3 gallons of water). Apply 3 gallons per 1,000 sq. ft. of ceilings, walls, etc. Birds do *not* have to be removed from the building before spraying.
- (c) Apply 1% malathion spray (5 ounces of 25% WP, or 4 tablespoons of 57% EC per 1 gallon of water). Apply liberally to litter, walls, ceilings, roosts, nests, and adjacent areas. Force-spray into cracks and crevices. Birds do *not* have to be removed from the building before spraying.

Building Atomizers (Stationary)

Use pyrethrum oil-base space sprays (0.1% pyrethrins plus 1% piperonyl butoxide) at the rate of ½ fluid ounce per 1,000 cu. ft. on a daily basis for fly control in closed egg rooms.

Mist Machines (Portable)

These mechanical foggers are labor-saving, especially for caged birds. However, these machines concentrate applicators which use different dosage rates than ordinary sprayers. Use 10 tablespoons of malathion 57% EC, or 6 ounces of carbaryl (Sevin) 80% sprayable powder, or 10 ounces of carbaryl (Sevin) 50% WP per 1 gallon of water at the rate of 1½ gallons per 1,000 birds. **FOLLOW LABEL INSTRUCTIONS AND PRECAUTIONS.**

Manure Drenches

When other recommended measures cannot be used, treat the manure with a fuel oil or water drench of dimethoate (Cygon), ronnel (Korlan) or malathion.

Use dimethoate (Cygon 2-E), ½ pint in 5 quarts of oil or water; or ronnel (Korlan 4E), 1 quart in 6 gallons of oil or water; or malathion, 5 ounces 25% WP per 1 gallon of oil or water, as a coarse spray on poultry droppings in caged layer houses and on manure piles.

A sprinkling can may be used to apply the larvicide lightly, but evenly, over the manure. Water emulsions can be used, but they may liquefy manures and increase the fly problem. An oil solvent is preferable since it inhibits fly development.

It is not necessary to remove caged layers when using the above insecticides as a manure drench. Avoid direct spray contact with the birds.

Fly Traps and Electrical Grids

Many mechanical traps, using baits or grids, are available commercially. They often trap and kill large numbers of flies. However, their primary function is to supplement sanitation and insecticidal control programs. Satisfactory control of heavy fly populations is not obtained by these devices alone.

The use of pesticides is necessary to safeguard the health of poultry as well as increase production efficiency. When properly used, pesticides are safe and effective, but they can be injurious to humans or animals, or result in harmful residues in meat and eggs if used improperly. Avoid contamination of feed and water.

General warnings for all materials suggested in this bulletin:

- **READ LABEL BEFORE USING ANY INSECTICIDE.**
- Provide ventilation during the use of all materials.
- Avoid undue exposure of the birds to mists and vapors during application. Do not apply any material directly on the birds unless directions say you can do so safely.
- Do not breathe any form of the insecticides. Face masks can be purchased for protection.
- If any form of insecticides, whether concentrated or dilute, are spilled on the skin, wash immediately with soap and water.

Michigan Poison Control Centers

In Case of Poisoning:

1. *Call your physician.* NOTE TO PHYSICIAN: The table below lists Poison Control Centers in Michigan which can furnish specific information including antidotes for various trade and common named poisons. Services of the Centers are intended mainly for Medical Doctors. However, offices remain open 24 hours a day and can give emergency poison treatment advice over the phone.

- Meat and eggs should not come in contact with any chemical which may contaminate it.
- Chemically treated manure should not be applied to any areas in which vegetables are grown, unless specific materials are approved for such vegetables. Read the label for this information.
- Do not contaminate feed, watering cups, wells, ponds or streams with pesticides.
- Store pesticides in their original, plainly labeled containers, safely away from livestock, pets, and children. *Keep them under lock.*

ALL INSECTICIDES AND MITICIDES are poisonous in varying degrees. Handle them cautiously so that they will not poison livestock, children, or the user. When using insecticides, do not increase the dosage. Measure all materials carefully.

Apply chemicals no closer to slaughter than the time given in this bulletin. Read the package label for additional instructions on how to use pesticide chemicals safely. Meat and eggs can be seized if they contain more insecticide or miticide than allowed.

Do not allow insecticides or miticides to drift onto pastures, hayfields, food crops, wood lots, non-crop areas, lakes, or ponds. Certain restrictions placed on chemicals when used on animal or human food crops are listed in this bulletin. When applied to water or wildlife areas, some of the materials listed may kill fish or wildlife.

To determine the dangers of drift, read the label on the package. Follow the same restrictions for insecticide and miticide drift as for direct application of the same materials to food crops. For dangers of fish and wildlife poisoning from insecticides and miticides applied to water or areas other than lands, contact your County Agricultural Agent.

2. *For poisons spilled on the skin:* Wash thoroughly with large amounts of soap and warm water. Particles in the eyes may be removed by thorough flushing with plain water. For phosphate materials absorbed through the skin, give atropine by injection or in tablet form.

3. *For poisons that have been inhaled:* Place the patient in the open air. Give atropine as directed above if a phosphate material is responsible. Administer artificial respiration when necessary.

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4. For poisons that have been swallowed, induce vomiting as soon as possible. To do this, gently stroke the inside of the throat and/or give an emetic such as warm salt water (1 tablespoon in a glass of water). Repeat until the vomit fluid is clear. After the stomach has been emptied give a demulcent such as raw egg white mixed with water.

5. When the physician arrives, he may inject 1/30 to 1/60 of a grain of atropine sulfate at hourly inter-

vals for phosphate materials, or phenobarbital for chlorinated hydrocarbon chemicals.

NOTE: A new antidote, specific for phosphate chemicals, is available to doctors for emergency treatment of phosphate poisoning. This antidote, called PAM (protopam chloride or pralidoxime) can be injected intravenously by doctors or prescribed in tablet form. In several instances persons poisoned by phosphate chemicals have responded to PAM when atropine failed to give desired results.

City	City	City	City
ADRIAN Poison Control Center Emma L. Bitby Hospital 818 Riverside Dr. 49221 285-6161 Robert Greiner, M.D., Dir. Thomas Arnold, R. Ph., Assoc. Dir.	Poison Information Center Detroit City Health Department Herman Kiefer Hospital 1151 Taylor Ave. 48202 872-3334 or TR 2-1540 - Ext. 376 Paul T. Chapman, M.D. William C. Fredetick, Sc. D.	HANCOCK Poison Control Center St. Joseph's Hospital 200 Michigan Ave. 49630 482-1123 Howard E. Otto, M.D. Sr. Mary Sharon Jones, R. Ph.	PETOSKEY Poison Control Center* Little Traverse Hospital 416 Conable 49770 347-2551 James M. Stamm, R. Ph.
ANN ARBOR Poison Control Center University Hospital 1405 E. Ann St. 48104 764-5102 Patricia O'Connor, M.D. Owen Haig, M.D., Assoc. Dir. Robert Pearson, R. Ph.	Poison Treatment Center* Saratoga General Hospital 1900 Grand Ave. Lakeview 6-5100 Wm. B. Hennessey, Chief Pharmacist	JACKSON Poison Treatment Center* Foote Memorial Hospital 205 N. East St. 49201 783-2771 Ethan Stone, M.D.	PONTIAC Poison Control Center* St. Joseph Mercy Hospital 900 Woodward Ave. 48053 338-9111 Robert J. Mason, M.D.
BAD AXE Poison Control Center Hubbard Memorial Hospital 423 E. Irwin St. 48413 269-6444 Alice F. Shoemaker, R. Ph. Roy Gettel, M.D.	Poison Control Center Mount Carmel Mercy Hospital 6071 W. Outer Dr. 48235 842-9820 John Moses, M.D. Forrest P. Becker, R. Ph.	KALAMAZOO Poison Control Center Bronson Methodist Hospital 252 E. Lovell St. 49006 342-9820 H. Sidney Hoersma, M.D. Kenneth Huckendubler, R. Ph.	PORT HURON Poison Control Center Mercy Hospital 2601 Electric Ave. 48600 985-9531 Robert Lugg, M.D.
BATTLE CREEK Poison Control Center Community Hospital 200 Tomkins St. 49016 963-5521 Metta Lou Henderson, R. Ph.	ELOISE Poison Control Center Wayne County General Hospital 30712 Michigan Ave. 48132 723-2500, Ext. 6236 - 6231 Gerald Stair, M.D., Dir. Kenneth Vaughn, M.D., Assoc. Dir.	LANSING Poison Control Center St. Lawrence Hospital 1210 W. Saginaw St. 48914 372-3610 Howard Comstock, M.D. Richard Campbell, R. Ph.	SAGINAW Poison Control Center Saginaw General Hospital 1447 N. Harrison Rd. 753-3411 Wm. C. Mason, M.D. Dale Schultz, R. Ph.
BAY CITY Poison Control Center* Mercy Hospital 100 15th St. 805-8511 Frederick Meyer, R. Ph.	FLINT Poison Control Center* Hurley Hospital 663 Ave. & Begole 48502 232-1161 William Nichols, M.D., Dir. Douglas L. Vivian, R. Ph., Coordinator	LINCOLN PARK Poison Control Center Outer Drive Hospital 26400 Outer Drive 48146 388-0606 Carl A. Gagliardi, M.D.	ST. JOSEPH Poison Control Center Memorial Hospital* 2611 Morton Ave. 49085 803-1674 Marshall J. Feeley, M.D.* James W. Skinner, M.D. 2615 Niles St. 49065
BENTON HARBOR Poison Treatment Center* Mercy Hospital 990 Agard 925-8811	GRAND RAPIDS Poison Control Center Blodgett Memorial Hospital 1840 Wealthy, S.E. 49606 456-5301 John F. Foxworthy, M.D. Donald Ekdom, R. Ph.	MARQUETTE Poison Information Center St. Luke's Hospital West College Ave. 49855 226-3511 Norman Matthews, M.D. Tom Finlan, R. Ph.	TRAVERSE CITY Poison Control Center Munson Medical Center Traverse City 49684 947-6140 Philip K. Wiley, M.D. A. McCrackin, R. Ph.
BERRIEN CENTER Poison Control Center Berrien General Hospital Dean's Hill Rd. 49102 471-7761 Richard C. Chaudoir, R. Ph.	POISON CONTROL CENTER Butterworth Hospital 100 Michigan, N.E. 49503 451-3591 John R. Wilson, M.D.	MIDLAND Poison Control Center Midland Hospital 4065 Orchard Drive 48640 835-6711 K. W. Linsenmann, M.D. Mrs. Anne Gagne, R.N.	WAYNE Poison Treatment Center Annapolis Hospital 33125 Annapolis 722-4400 House Physician on duty
COLDWATER Poison Control Center Community Health Center of Branch County 274 E. Chicago St. 49036 379-9501 John C. Heffelfinger, M.D. Office 275-2339	POISON TREATMENT CENTER Grand Rapids Osteopathic Hospital 1919 Boston St., S.E. 49506 452-3131 Eugene M. Johnson, D.O. Oliver Gysin, R. Ph.	MONROE Poison Control Center Memorial Hospital of Monroe 700 Stewart Road 48161 241-6500 Donald Wojack, R. Ph.	WEST BRANCH Poison Control Center Tollfree Memorial Hospital 335 E. Houghton 345-3660 Emergency Room
DETROIT Poison Control Center Children's Hospital 5224 St. Antoine St. 833-1000 Paul V. Woolley, Jr., M.D. Regine Arorow, M.D.	Poison Control Center St. Mary's Hospital 201 LaFayette, S.E. 49503 459-3131 Walter Daffin, M.D. Myrtle McLain, M.D., Assoc. Dir.		YPSILANTI Poison Treatment Center Beyer Memorial Hospital 28 So. Prospect 48197 HU 2-6500 Gust Petropoulos, M.D.

*Facilities available for determining cholinesterase levels in blood samples.

INSECTICIDES FOR POULTRY PESTS

Pest	Material and Formulation ¹	Minimum Days Lost Application to Slaughter	Amount per Bird or Area If Appropriate	Comments
BEDBUGS AND FLEAS	Use carbaryl (Sevin) bird dust treatment and poultry premise (spray) treatment as under Chicken Mites.			
CHICKEN MITES (Hide on roosts and in wall cracks during day and feed on birds at night).	carbaryl (Sevin), 5% dust (Use as bought).	7	1 lb. per 100 birds.	Use shaker can, squeeze bottles or hand duster. Direct dust to vent and fluff areas. Repeat within 4 weeks, if necessary. Do not contaminate eggs, feed, drinking water, or nest litter.
	carbaryl (Sevin), 5% dust (Use as bought).	7	2½ lbs. per box for 50 birds.	Dust both box treatment. ² Do not contaminate nests, eggs, feed or water troughs.
	carbaryl (Sevin), ½% in water spray.	7	1 to 2 gal. per 1,000 sq. ft.	Mix 2 pounds carbaryl, 50% WP in 25 gallons of water. Spray roosts and walls for thorough coverage, and force-spray into cracks. Do not treat eggs or nest litter.
	coumaphos (Co-Ral), ¼% in water spray.	0	1 gal. per 1,000 sq. ft. of surface.	Litter treatment. Mix 6 ounces of Co-Ral, 25% WP in 5 gallons of water. Thoroughly cover litter, walls, ceilings, floors, roosts, nests, and adjacent areas. Repeat as necessary.
	coumaphos (Co-Ral), ½% dust (Use as bought).	0	1 lb. per 100 birds.	Do not use more than once per week. Do not dust within 10 days of vaccination or other stress periods. Provide thorough ventilation while dusting.
	malathion, 4% dust (Use as bought).	0	Amount to use depends on size of birds.	Get thorough coverage directly to birds. Apply with a rotary hand duster, puff duster, or by sprinkling from a can or other container.
	malathion, 0.7% in water spray.	0	1 to 2 gal per 1,000 sq. ft.	Mix 4 tablespoons malathion, 57% EC or 5 ounces 25% WP in 1 gallon water. Apply liberally to litter, walls, ceilings, roosts, nests, and adjacent areas. Force-spray into cracks and crevices. Use a sprinkling can.
	nicotine sulfate, 40% solution (in oil or water).	0	1 pint per 150 to 200 ft. of running roost.	Paint on roosts only. Repeat in 10 days. Use caution in application. Avoid spillage on skin and wash off promptly.
DARKLING BEETLE (lesser mealworm)	carbaryl (Sevin), 5% dust (Use as bought).	7	1 lb. dust per 40 sq. ft.	Treat floor litter. Employ sanitary measures. Apply dust thoroughly and force dust into cracks. Read the label.
LICE	carbaryl (Sevin), 5% dust (Use as bought).	Same as for Chicken Mites for both the direct dusting and the dust both box treatments.		
	carbaryl (Sevin), 4% in water mist spray.	7	1½ gal. per 1,000 birds.	Mist-spray birds. Mix 6 ounces of Sevin, 80% sprayable or 10 ounces of Sevin, 50% WP in 1 gallon of water. Ventilate while spraying. Avoid treating nest litter. Do not repeat treatment within 4 weeks.

(Table Continued Below)

	coumaphos (Co-Ral), ¼% in water spray.	Same as for Chicken Mites litter treatment.		
	coumaphos (Co-Ral), ¼% in water spray.	0	1 gal. to 100 to 125 birds or ½ ounce of the spray per indi- vidual bird.	Spray birds directly. Mix 6 ounces of Co-Ral, 25% WP in 5 gallons of water. Repeat when necessary, but not within 1 week. Do not spray within 10 days of vaccination or other stress or in conjunction with other organophosphate compounds. Do not spray in a confined, non-ventilated area.
	malathion, 4% dust (Use as bought).	0	Amount to use depends on size of birds.	Dust birds thoroughly. Repeat in 4 to 8 weeks, or when necessary.
	Nicotine sulfate, 40% solution (in oil or water).	0	1 pint per 150 to 200 ft. of running roost.	Paint on roosts only. Repeat in 10 days. Use caution in application. Avoid spillage on skin and wash off promptly.
NORTHERN FOWL MITE (Lives on bird all the time—since roosters do not dust themselves, catch and dust each one individually).	carbaryl (Sevin), 5% dust (Use as bought).	Same as for Chicken Mites for both the direct dusting and the dust both box treatment.		
	carbaryl (Sevin), 5% dust (Use as bought).	7	1 lb. dust per 40 sq. ft.	Get thorough coverage and force dust into cracks. Read the label. Treat floor litter.
	carbaryl (Sevin), 4% in water mist spray.	Same as for Lice mist spray treatment.		
	coumaphos (Co-Ral), ¼% in water spray.	Same as for Lice, spray birds directly.		
	coumaphos (Co-Ral), ½% dust (Use as bought).	Same as for Chicken Mites litter treatment.		
	malathion, 4% dust (Use as bought).	Same as for Lice bird treatment.		
	malathion, 4% dust (Use as bought).	0	1 lb. per 50 to 60 sq. ft. of litter.	Get thorough coverage and force dust into cracks. Read the label. Treat floor litter, nests, roosts and adjacent areas.

¹Abbreviations used in this bulletin:

- WP — Wettable Powder
 EC — Emulsifiable Concentrate, or Emulsion
 SC — Suspension Concentrate
 D — Dust

²Dust boxes are a simple method of getting birds to dust themselves. Use a box about 1½ feet long by 1 foot wide by 3 inches deep (one box for every 30 floor birds). Read the label on all insecticides BEFORE using them.