

Managing External Parasites of Texas Livestock and Poultry



TABLE OF CONTENTS

Safety Tips for Using Pesticides	3
Livestock Pests	4
House Fly	4
Stable Fly	4
Screwworm Fly	4
Horn Fly	4
Management of Pyrethroid-resistant Horn Flies	4
Blow Fly	5
Cattle Grub (Heel Fly)	5
Bot Fly	6
Horse Fly, Deer Fly, Mosquito, Black Fly	6
Lice	6
Mites	6
Ticks	6
Fleas	7
Pesticide Formulations	7
Sprays	7
Dips	7
Pour-ons	7
Spot-ons	7
Dusts	7
Injectables	8
Feed and Mineral Pesticide Additives	8
Insecticide-impregnated Ear Tags	8
Baits	8
Pastes	8
Boluses	8
Dilution Chart for Mixing Sprays or Dips	9
Pesticide Suggestions	10
Beef Cattle and Nonlactating Dairy Cattle	10
Lactating Dairy Cattle	15
Sheep and Nonlactating Goats	16
Swine	18
Horses	19
Poultry	20
Premises (Inside or outside of animal quarters)	22
Insecticides and Corresponding Trade Names	23
Policy Statement for Making Pest Management Suggestions	24

Managing External Parasites of Texas Livestock and Poultry

Clifford E. Hoelscher, Carl D. Patrick and James V. Robinson

Extension Entomologists
The Texas A&M University System

Integrated Pest Management (IPM) is a system approach that combines a variety of livestock production practices using both biological and chemical control methods. External and internal arthropod parasites of livestock and poultry are a constant

menace. These pests lower the quality of animal products (hides, hair, wool) by physical feeding damage; reduce meat, milk and egg production by sucking blood from animals; transmit diseases; and cause

energy loss. Suggested pesticides will aid in control of the major parasites where insecticide resistance has not developed. A special section addresses the management of insecticide-resistant pests.

Safety Tips for Using Pesticides

- ★ Read the labels and follow directions and safety precautions. (Never use pesticides inconsistent with the label.)
- ★ Record all pesticide usage including the common name, trade name, formulation, dilution, application rate and date of treatment.
- ★ Use face masks or respirators and protective clothing during spraying. Avoid breathing spray mist or dust.
- ★ If pesticides are spilled on the skin or clothing, wash thoroughly with soap and water and change clothes.
- ★ Do not eat, drink or smoke when handling pesticides.
- ★ Provide adequate ventilation when applying pesticides.
- ★ To prevent illegal meat and milk residues and possible harm to the animal, never exceed label rates of application.
- ★ Never apply pesticides closer to slaughter dates than the number of days listed on the label.
- ★ Avoid drift to adjacent cropland, yards, wood lots, lakes or ponds. Some materials may injure and kill fish or wildlife crops.
- ★ Avoid treatment to animals that are sick, overheated or stressed from shipping, dehorning, castration, recent weaning, etc.
- ★ Avoid contamination of feed, mangers, water, milk and milking equipment.
- ★ Do not spread treated manure on cropland unless label approval is given.
- ★ Store pesticides in the original, labeled containers, safely locked away from children, pets and livestock.
- ★ Dispose of empty pesticide containers promptly and properly according to specified recommendations. Stay out of the smoke if containers are burned.
- ★ Contact a physician at once in all cases of suspected poisoning. Symptoms of organic phosphate poisoning include blurred vision, abdominal cramps and tightness in the chest. Atropine is antidotal for some organophosphorus pesticides.

Livestock Pests

House Fly

The house fly is suspected of reducing weight gains and feed efficiency in livestock. House flies can be a great nuisance to workers as well as surrounding neighborhoods. Pesticides alone will not control house flies. Sanitary measures that eliminate fly breeding areas such as spreading of manure, regular cleaning and prevention of waste accumulation, and regular removal of spilled feed are necessary. Spread manure thinly in fields so fly eggs and larvae will be killed by drying and heat. Several pesticides can be used on manure piles to prevent maggot development.

Pesticides in spray or bait forms may be used to control adult flies in livestock barns and poultry houses. Do not contaminate feed, utensils, drinking water or milking equipment with any pesticide.

Stable Fly

Stable flies suck blood, irritate animals and reduce weight gain and milk production. They bite the legs of horses and cattle and ears of swine. These flies breed in mixtures of manure and decaying litter around barns. Dispose of manure and litter as outlined for house flies. Sanitation is important in reducing stable fly numbers. Immediate fly control may be obtained by spraying fly resting areas with approved pesticides.

Screwworm Fly

The screwworm fly has been eradicated from Texas. The last confirmed case was reported in 1982. Eradication was accomplished over a 20-year period using sterile-male fly releases, insecticide baits and producer diligence and support. Screwworm eradication has now been achieved in the Republic of

Mexico. Eradication efforts are presently underway in Panama and Jamaica.

There is a constant threat of reintroduction of the screwworm by the accidental transportation of infested animals to uninfested areas. Producers must always be aware of the potential threat of screwworm infestations. Producers are urged to inspect livestock for screwworms and submit all suspect blow fly larvae found in animals for positive identification. Collect 10 larvae from deep within the wound. Place them in alcohol and send samples to the Southwest Screwworm Eradication Laboratory, Box 969, Mission, TX 78572. Telephone (979) 845-6812 at Texas A&M University for additional information. The USDA, APHIS, international services office at (301) 734-8892 also can provide assistance. Suspect screwworm samples can be sent directly to the National Veterinary Science Laboratory, Box 844, Dayton Road, Ames, IA 50010, (515) 239-8301.

Report any suspected screwworm cases to your county Extension agent or local veterinarian. Eradication personnel can take the appropriate measures only when they are aware of the problem.

Horn Fly

Horn flies suck blood, irritate cattle and reduce weight gains by decreasing animal thrift and vigor. Horn flies can become numerous on cattle from late spring to early fall. There are several self-treatment devices that may be used to control horn flies. Cable-type back rubbers covered with an absorbent material treated with an insecticide-oil solution or fabric dust bags partially filled with an approved pesticide dust have been used successfully. Place these devices near water, feed or mineral sources or in gaps or gateways to encourage use. A 2-

to 3-week adjustment period may be necessary before cattle begin to use self-treatment devices regularly. Forced use of these self-applying devices results in more rapid and effective control of horn flies and may aid in lice control.

Insecticide-impregnated ear tags provide excellent horn fly control for periods of 2 1/2 to 5 months if properly attached to the ear and if pyrethroid or organophosphate resistance is not a factor.

Automatic, animal-activated sprays often are installed in exit chutes of milking barns. Animals can be treated conveniently twice each day (or less often as necessary) with very small volumes of specially formulated pesticides for biting fly and other insect control.

Management of Pyrethroid-resistant Horn Flies

Field observations and laboratory studies conducted during the summer and fall of 1984 confirmed the development of pyrethroid resistance in horn flies. The combination of very effective insecticides and widespread ear tag use by cattlemen has allowed horn fly resistance to develop. Cross-resistance to the common pyrethroids has been confirmed by field observations. Flies that have developed resistance to one of the pyrethroids will be resistant to all other pyrethroid insecticides currently labeled for use in Texas. However, the newer products may continue to provide acceptable control for several years by using more potent materials.

Continued treatment of successive generations of flies with the same type of insecticide can cause insecticide resistance to develop. Individuals in the population that are carrying genes susceptible to the toxicant are quickly killed, and the survivors, carrying

resistant genes, reproduce to build the next, more difficult to kill generation. Rotation of insecticides with different modes of action is extremely important in avoiding or delaying resistance.

Insecticide ear tags perform by dispensing a small amount of the insecticide continuously over a 2 1/2- to 5-month period. The insecticide diffuses to the tag surface and is deposited on the animal's body through normal body movement. Flow of the insecticide from the tag starts at a high rate and decreases to a point where fly control is no longer achieved. Ear tags have provided economical control of the horn fly, Gulf Coast tick and spinose ear tick. Data show that horn flies are the most obvious pest that can become resistant to pyrethroid insecticides dispensed from ear tags.

The following are management options for control of pyrethroid-resistant horn flies:

Option 1: Do not treat cattle for horn flies.

Option 2: Treat cattle with insecticides only after horn fly populations reach 200 to 250 per head. Research has indicated that if there are fewer than 250 flies per animal, economic losses rarely occur.

Treatment Options:

- A) Use alternate chemistry type sprays, dusts or other formulations. Treat only when horn fly populations exceed 200 to 250 per head.
- B) Use organophosphate (OP) ear tags such as Cutter 1®, Terminator®, OPTimizer® or Commando®. Do not use organophosphate ear tags if they have been used the previous 2 or more successive years. If ear tags are used, remove tags when calves are weaned or cows are worked in the fall. If horn fly populations exceed 200 to 250 per head at the time tags are

removed, apply a spray or dust treatment to reduce the potential population of overwintering flies.

Where there are flies resistant to pyrethroid or OP insecticides, continued use of these chemistry types can increase resistance levels. Do not use pyrethroids in any formulation including organophosphate/pyrethroid combination ear tags where resistance is a problem. Left untreated, susceptible flies will mate with other susceptible or resistant flies. This reduces the rate at which resistance develops. Periodic application methods tend to increase resistance levels less than continuous release methods.

The combination ear tags include Double Barrel® and Max Con®. These dual chemistry tags are not listed because resistance develops for both types of compounds with a single treatment.

Blow Fly

Blow fly larvae, commonly referred to as fleeceworms or wool maggots, attack sheep and goats. Infestations usually start around the crotch in wool or mohair contaminated with feces and urine. Ordinarily, tagging and docking animals prevents fleeceworm infestations. If fleeceworms occur, shear the affected area and treat with a labeled insecticide.

Blow fly maggots also are found in wounds on other livestock. Black blow fly larvae frequently infest dehorning wounds during winter months and occasionally infest the navels of newborn animals.

Cattle Grub (Heel Fly)

Cattle grubs cause economic losses because they reduce milk production, weight gain, feed efficiency and hide value. Losses also are suffered with carcass trim and lower meat quality.

Cattle grubs are the larval stage of heel flies. Adult heel flies emerge in late winter, spring or summer. Female flies lay eggs on the legs and lower body regions of cattle. Heel fly activity causes cattle to run wildly with tails in the air (gadding), or to stand in water to protect themselves. Eggs attached to the hairs hatch into tiny larvae that penetrate the skin and begin to migrate through the body of the animal. Larvae congregate in the tissues of the esophagus, but eventually move to the back in late summer, fall or winter. Grubs develop with a "cyst" or "warble" just under the skin on the back. After 6 to 8 weeks, grubs leave the animal's body through holes cut in the hide, fall to the soil and pupate.

Although cattle grubs can be controlled after they reach the animal's back, earlier control is preferable. Once the grubs reach the back, most of the damage has been done.

Systemic pesticides administered as sprays, dips, pour-ons, boluses and injectables are distributed through the animal's body; systemic pesticides destroy cattle grubs by contact action. To avoid the possibility of a host-parasite reaction, cattle should be treated with systemics as soon as possible after heel fly activity ceases but not within a 6- to 7-week period prior to the expected appearance of grubs in the back. Typical host-parasite reaction symptoms include a swollen esophagus, bloat, profuse salivation, discomfort and, in extreme cases, death. Do not confuse a host-parasite reaction with organophosphate poisoning, which is quite similar. Atropine, an antidote for OP poisoning, is NOT RECOMMENDED for a host-parasite reaction and may make the problem worse.

Bot Fly

Two species of bot flies attack horses. With heavy infestations horses become unthrifty. Eggs are attached to hairs on the lip and under the jaw or on the front legs of horses, depending upon the bot fly species. Eggs hatch directly or in response to warmth and moisture, usually where horses lick themselves. Larvae become attached to and feed in various portions of the digestive tract, from the mouth to the rectum. Mature larvae are passed with the feces. Pupation occurs in the soil and adults emerge 3 to 10 weeks later. Treatment for bots is an oral dose of an approved pesticide.

The sheep nose bot is a hairy, yellowish fly about the size of a honey bee. It deposits living larvae around the nostrils of sheep. The larvae crawl into nasal passages where they remain until mature. After varying lengths of time, they fall to the ground where they pupate.

Horse Fly, Deer Fly, Mosquito, Black Fly

Horse fly and deer fly adults are vicious biters. They cause livestock to lose weight and may transmit anaplasmosis, anthrax and other diseases. Most horse flies and deer flies are found in brushy or low lying pasture areas near creeks, streams or tanks that provide damp soils in which the immature stages develop. Moving livestock from such areas may provide them some relief from the attacks of horse flies and deer flies.

Mosquitoes are important pests of livestock in irrigated areas or where there is heavy rainfall. Producers may not fully appreciate the losses that mosquitoes cause, for heaviest attacks often occur at night. Mosquitoes are carriers of several diseases, including sleeping sickness in horses.

The black fly is a small, humpbacked fly which can occur in tremendous numbers, causing irritation and even death to livestock. They are important vectors of diseases such as leucocytozoan disease of turkeys. Smokey fires can give animals relief from black flies. Insecticides also give temporary relief if applied frequently. Larvae develop in rivers and streams. Larvicidal control requires careful study and the accurate application of insecticide.

Lice

Lice cause the U.S. cattle industry annual losses of several million dollars. These losses result from anemia, unthriftiness, reduced rates of growth, inefficient feed utilization, secondary diseases resulting from lowered resistance of the animals and even mortality.

Four species of lice suck blood from cattle; one feeds on hair and scales. Lice are more abundant during winter and spring when the hair is long and animals are in close proximity. For effective control, treat cattle in the late fall and early winter.

Several species of sucking and biting lice attack sheep and goats. Animals infested with lice rub, bite and pull the infested area, damaging wool and mohair.

Only one species of lice occurs on hogs. These blood-sucking lice transfer from one animal to another when the animals are in close contact.

Poultry are attacked by several species of biting lice that cause irritation and weight loss, reduce egg production, decrease market quality of birds and even kill some birds.

Two species of lice are commonly found on horses in Texas. One sucks blood and the other is a chewing louse which feeds on skin scales and hair. Both

produce intense itching and irritation that cause the animal to rub and scratch.

Mites

Mange mites burrow into the skin, producing tunnels in which the eggs are deposited. Scab mites deposit their eggs at the bases of hairs or in the skin. Feeding of the mites produces scabs which constantly enlarge as feeding progresses.

Certain species of scab mites attacking cattle, sheep or goats are under state quarantine regulations. If the presence of mites is suspected, contact personnel of the Texas Animal Health Commission, Box 12966, Austin, Texas 78711, (512) 719-0700.

The chicken mite is an intermittent feeder, usually remaining on the host a short time. The northern fowl mite and the tropical fowl mite usually spend their entire life cycles on hosts.

The scaly-leg mite burrows under the scales on the feet and legs of fowl, causing irritation, sores and secretions.

Depluming mites burrow into the skin of chickens and cause irritation around the bases of feathers.

Chiggers are frequent pests of chickens and turkeys on range. They cause irritation and lowered feed conversion efficiency, but the main concern is skin blemishes which lower the carcass grade of processed poultry.

Ticks

Several species of hard and soft ticks attack livestock and poultry. *Boophilus* ticks are primarily restricted to the Republic of Mexico as a result of the U.S.D.A. quarantine program at the U.S. border. The two species of *Boophilus* ticks vector Texas cattle fever. The

lone star tick occurs principally in wooded or brushy areas during spring and summer, and is most abundant in east central and west central Texas. The Gulf Coast tick now ranges from the Gulf Coast of Texas to central Oklahoma. Peak adult activity in Texas occurs in late summer and early fall. Adults attack cattle mainly around the ears, eyes and poll of the head; the lesions often resulted in screwworm infestations before fly eradication was achieved. The winter tick can become a problem during the late fall and winter. In the eastern half of the state, the black-legged tick occurs in the spring and winter. The spinose ear tick is not found throughout Texas. These ticks, which attach deep within the ears of livestock, cause intense irritation, wax accumulation and excretions, which may cause ear infections.

The fowl tick ("blue bug") injures poultry by sucking blood, transmitting disease, causing weight loss, lowering egg production and causing skin blemishes which reduce market value.

The tropical horse tick attacks horses and is usually found attached within the ears and on the mane and nostrils. Its distribution is restricted to the southern tip of Texas and Florida. Its feeding activity causes intense irritation, making infested horses very head shy. The tick also can transmit equine piroplasmiasis.

Fleas

Sticktight fleas are a common pest of poultry throughout the southern areas of the United States. When fleas are abundant, their blood sucking reduces egg production and kills young birds. They attach to the comb and wattles and around the eyes.

Pesticide Formulations

Livestock pesticides are formulated as wettable powders, pour-ons, spot-ons, emulsifiable concentrates, smears, feed additives, dusts, injectables, aerosols, impregnated PVC, baits and pastes. Only those pesticides made specifically for animals should be used. Other formulations of the same pesticide may be dangerous to the animal. Handle all pesticides carefully and follow exactly all label instructions.

Sprays

Prepare only enough solution to adequately spray the animals. Pesticides may undergo chemical changes after being mixed with water, creating potential hazards to the applicator and animals. Emulsifiable concentrate or soluble formulations are better than wettable powders for use in small sprays because less agitation is required to maintain a uniform mixture.

When spraying to control ticks, lice and mites, use enough water to cover the animal thoroughly. Wet animals to the skin when spraying systemic pesticides for cattle grub control. Sprayers can be moved easily from pasture to pasture; however, transporting water may be a problem because up to 1 gallon of spray per animal is often required for effective parasite control. Sprayers should have a high-volume piston pump with a suitable agitator when applying sprays made from wettable powders. Apply sprays at a pressure of 250 to 350 pounds per square inch.

Dips

Properly maintained dip vats provide effective parasite control. Vats can be filled early in the season and used several times during the year. Initial

cost of filling and charging the vat is high, but cost per animal may be relatively low since many animals can be dipped in the vat during the season with little additional expense. Because animals are wet thoroughly in a vat, good coverage is ensured.

When filling or recharging a dipping vat, use only formulations specially prepared for dipping animals. Do not mix two or more different products unless specified on their labels. Follow the manufacturer's label directions for mixing fresh dips and for replenishing previously used dips. Mix the material thoroughly in the vat before each use.

Pour-ons

Pour-on pesticides are formulated for direct application to the backlines of animals. They are used principally for cattle grub and louse control. Recommended materials may be purchased in ready-to-use or water-miscible formulations. The chemical is absorbed through the skin and circulates through the animal's system. Backline treatments with pour-on material also provide horn fly control for a short period of time.

Spot-ons

Spot-on pesticides can be easily applied for cattle grub and louse control. This method involves the application of a small amount of pesticide with specially designed applicators in a single spot on the backlines of animals.

Dusts

Dusts can be applied to animals by hand shakers or in self-treatment dust bags. Their chief value is for horn fly and lice control on large animals and for lice and mite control on poultry.

Injectables

Avermectin treatment for beef cattle is labeled as a subcutaneous injection. Present formulations are also labeled for internal parasite control.

Feed and Mineral Pesticide Additives

Certain pesticides may be administered as feed or mineral additives. These control certain fly species whose maggot stages occur in animal manure.

Insecticide-impregnated Ear Tags

Ear tags are plastic devices that contain an insecticide for ear tick and horn fly control. They control ear ticks for 4 to 5 months and horn flies for 2 1/2 to 5 months (in areas where flies are not resistant to pyrethroids). Observations across Texas have indicated that longer residual control can be expected in the central and western areas compared to the more humid coastal areas of south Texas.

Baits

Baits are primarily used to help control house flies around feedlots, dairies, poultry houses, livestock barns and other places flies tend to congregate. Baits are made from dry sugar, syrup or other substances that attract flies. A small amount of pesticide is added to the mixture to kill flies that feed on the bait.

Pastes

Several treatments for horses and cattle are formulated as pastes to be applied orally with a ready-to-use syringe. Label instructions should be followed closely.

Boluses

Boluses are designed to slowly release materials in the animal's reticulum. Vigilante® contains dimilin which is an insect growth regulator. Ivomec SR Bolus® contains an avermectin which controls a broad spectrum of internal and external pests.

Read the Label - Follow Directions

The Environmental Protection Agency establishes tolerances for pesticide residues in agricultural commodities intended for human consumption. Follow suggestions in this publication and on the manufacturer's label concerning dosage, frequency of application and slaughter interval to avoid illegal residues. Read thoroughly the remarks and safety restrictions in the following table and on the manufacturer's label.

Pesticide Suggestions

NOTE: The tables on the following pages are intended to serve only as a guide to the selection of pesticides for control of specific parasites. Space does not permit presenting full instructions for use of all products. Before purchasing any insecticide, read the label closely to determine whether the product is appropriate for your uses. Pay particular attention to all directions, restrictions and precautions and use the product in strict accordance with the label to avoid personal or animal injury or illegal residues in meat or milk. A list of chemical and corresponding trade names for various insecticides is provided on page 23 of this guide.

Dilution Chart for Mixing Sprays or Dips

Amount of Insecticide Concentrate in 100 Gallons and 5 Gallons of Total Mixture

Insecticide concentrate	1% Mix		0.5% Mix		0.25% Mix		0.60% Mix		0.03% Mix		0.01% Mix	
	100 Gal.	5 Gal.	100 Gal.	5 Gal.	100 Gal.	5 Gal.	100 Gal.	5 Gal.	100 Gal.	5 Gal.	100 Gal.	5 Gal.
5.7%EC	1.75 gal.	7.0 pt.	8.8 gal.	3.5 pt.	4.4 gal.	28.0 oz.	1.0 gal.	6.7 oz.	4.2 pt.	3.4 oz.	1.4 pt.	1.1 oz.
10% EC	10.0 gal.	2.0 qt.	5.0 gal.	1.0 qt.	2.5 gal.	1.0 pt.	4.8 pt.	3.8 oz.	2.4 pt.	1.9 oz.	0.8 pt.	0.63 oz.
11% EC	9.0 gal.	3.6 pt.	4.5 gal.	1.8 pt.	2.3 gal.	14.5 oz.	4.4 pt.	3.5 oz.	2.2 pt.	1.7 oz.	0.73 pt.	0.57 oz.
11.6 ELI	8.6 gal.	3.4 pt.	4.3 gal.	1.7 pt.	2.2 gal.	13.8 oz.	4.1 pt.	3.3 oz.	2.1 pt.	1.6 oz.	0.70 pt.	0.55 oz.
25% WP	33.4 lb.	1.6 lb.	16.7 lb.	13.3 oz.	8.3 lb.	6.7 oz.	2.0 lb.	1.6 oz.	1.0 lb.	0.8 oz.	0.33 lb.	0.27 oz.
25% EC	4.0 gal.	25.6 oz.	8.0 qt.	12.8 oz.	1.0 gal.	6.4 oz.	1.9 pt.	1.5 oz.	1.0 pt.	0.8 oz.	0.33 pt.	0.26 oz.
40% WP	20.8 lb.	1.0 lb.	10.4 lb.	8.3 oz.	5.2 lb.	4.1 oz.	1.3 lb.	1.0 oz.	10.0 oz.	0.5 oz.	3.34 oz.	0.17 oz.
40% WP	2.5 gal.	1.0 lb.	5.0 qt.	0.5 pt.	2.5 qt.	4.0 oz.	19.2 oz.	1.0 oz.	9.6 oz.	0.5 oz.	3.20 oz.	0.17 oz.
50% WP	16.7 lb.	13.3 oz.	8.3 lb.	6.7 oz.	4.2 lb.	3.4 oz.	1.0 lb.	0.8 oz.	0.5 pt.	0.3 oz.	0.17 pt.	0.10 oz.
57% EC	7.0 qt.	11.2 oz.	3.5 qt.	5.6 oz.	3.6 pt.	2.8 oz.	13.4 oz.	6.7 oz.	6.7 oz.	0.3 oz.	2.20 oz.	0.11 oz.

WP = Wettable powder

EC = Emulsifiable concentrate

ELI = Emulsifiable liquid insecticide

WDL = Water dispersible liquid

Fluid conversion for EC only:

1 gallon (gal.) = 4 quarts (qts.)

1 gallon = 128 fluid ounces (oz.)

1 quart (qt.) = 2 pints (pts.)

1 pint = 16 fluid ounces

1 fluid ounce = 2 tablespoons (tbsp.)

1 tablespoon = 3 teaspoons (tsp.)

Formulas and Examples

To use wettable powders (WP) use the following formula to find the number of ounces of wettable powder to mix in the spray tank.

A X S X 8.345

WP X 16 oz. = amount of WP in ounces

Where: A = amount finished spray (gallons)

S = percent spray mix desired

WP = % wettable powder

To use an EC, ELI or WDL use the following formula to find the number of **liquid ounces** to mix in the spray tank.

A X S X 128 oz. = quantity of liquid in ounces

C

Where: A = amount finished spray (gallons)

S = percent spray mix desired

C = % concentration liquid product

Example: To make 5 gallons of a 0.06% spray mix from a 25% WP

$$\frac{5 \text{ gal.} \times 0.06 \% \text{ spray} \times 8.345 \times 16 \text{ oz.}}{25\% \text{ WP}} =$$

$$\frac{2.5 \times 16 \text{ oz.}}{25} = 0.1 \times 16 = 1.6 \text{ oz.}$$

Example: To make 100 gallons of a 0.06% spray mix from a 12% EC

$$\frac{100 \times 0.6 \times 128}{12} = 0.5 \times 128 = 64 \text{ oz. or 4 pints}$$

Pesticide Suggestions

Pest	Pesticide	Formulation	Minimum days from last application to slaughter	Remarks and safety restrictions
Beef Cattle and Nonlactating Dairy Cattle				
Cattle Grub	Note: Systemic pesticides for cattle grub control may be administered as dips, sprays, pour-ons, injectables or spot-ons. Administer treatments between May and September 1, preferably soon after May 1 for best results. Animals should not be treated for grub control and internal parasites with certain products on the same day. In addition to restrictions listed below, follow all precautions and restrictions listed on the product label.			
1. Dips	Coumaphos (Co-Ral®)	25% WP 42% flowable	0	Agitate dip vat thoroughly before use. Do not apply to nonlactating dairy animals within 14 days of freshening. Do not treat animals less than 3 months old. Do not treat sick, convalescent or stressed livestock. Also controls horn flies, lice and ticks.
	Phosmet (GX-118®)	11.6% EC	21	Agitate dip vat solution thoroughly before use. Do not treat dairy animals. Do not treat calves less than 3 months old. Do not treat sick or debilitated animals. Also controls horn flies.
2. Sprays	Note: Thoroughly wet the animals to skin with spray from a high pressure sprayer using up to 1 gallon of finished formulation per animal.			
	Coumaphos (Co-Ral®)	25% WP 11.6 EC	0	Spray restrictions same as for Coumaphos above. Also do not spray animals for 10 days before or after shipping or weaning, or after exposure to contagious and infectious disease. Also controls horn flies, ticks and lice.
	Phosmet (Prolate®) (GX-118®) (Lintox-HD®)	11.6% EC	21	Do not treat dairy animals. Do not spray more than every 7 days. Do not treat calves less than 3 months old. Do not treat sick or debilitated animals. Also controls horn flies.
3. Pour- ons	Note: Under certain conditions, some pour-ons may cause minor skin irritation and scurfing. Show animals should be treated at least several weeks in advance of show time to allow any unsightliness to disappear.			
	Famphur (Warbex®)	13.2%	35	Use with caution on Brahman animals. Do not use on dairy cows or within 21 days of freshening. Do not treat calves less than 3 months old. Do not treat sick or stressed animals. Also controls horn flies and aids in louse control.
	Fenthion (Tiguvon®)	3.0%	35-45	Do not treat dry animals within 28 days of freshening. Do not treat animals less than 3 months old. Do not treat sick or stressed animals. Do not treat within 10 days of shipping or weaning. Also controls lice.
	Avermectin (Ivomec®) (Eprinex®) (Dectomax®)	0.5% ready-to-use 0.5% ready-to-use 0.5% ready-to-use	48 0 45	Apply 1 ml. per 22 lbs. of body weight.
	Milbemycin (Cydectin®)	0.5% ready-to-use	0	
	Phosmet (Prolate®) (GX-118®)	11.6% pour-on	21	Same restrictions as for Phosmet above.

Pesticide Suggestions (Continued)

Pest	Pesticide	Formulation	Minimum days from last application to slaughter	Remarks and safety restrictions
Cattle Grub (Cont.)				
4. Spot-ons	Fenthion (Spotton®)	20% ready-to-use	45	Do not treat dairy cattle of breeding age; calves less than 3 months old; or sick, convalescent or severely stressed livestock. Do not treat within 10 days of shipping or weaning.
5. Injectables	Avermectin (Ivomec®)	1% injectable	48	Use subcutaneous injection only. Not for intravenous or intramuscular use. Do not exceed 200 micrograms of avermectin per each kilogram (2.2 lbs.) of animal weight. No more than 10 mls. of Ivomec® should be used on animals over 1,100 lbs. (See label for specific instructions.)
	(Dectomax®)	1% injectable	45	Subcutaneous or intramuscular injection. Do not treat animals within 35 days of slaughter. 1 ml/110 lbs. of body weight. Do not use on dairy cattle over 20 months of age.
Horn Fly				
	Cyfluthrin (Cutter Gold®) (Cylence®)	10% ear tag 1% ready-to-use	0	Use 2 tags per head.
	Coumaphos (Co-Ral®)	1% dust 11.6% EC 42% ELI	0	Do not apply to dry animals within 14 days of freshening.
	Diazinon (Cutter 1®) (Terminator®) (Optimizer®)	40% ear tag 20% ear tag 20% ear tag	0 0 0	Use 1-2 tags per head when horn flies exceed 250-300 per head.
	Dichlorvos (Vapona®)	43.2% EC	0	DO NOT exceed recommended labeled rates.
	Ethion (Commando®)	36% ear tag	0	Use 1-2 tags per animal.
	Fenthion (Lysoff®) (Cutter Blue®)	7.6% pour-on 20% ear tag	21-35 0	Do not treat calves less than 3 months old, or sick, convalescent or stressed livestock. Do not treat non-lactating dairy cattle within 28 days of freshening. Apply 2 per animal.
	Fenvalerate (Ectrin®)	8% ear tag	0	Use 1-2 tags per animal.
	Lambda-cyhalothrin (Saber Extra®)	10% ear tag	0	Use 1-2 tags per animal.
	Methoxychlor (Marlate®)	50% WP	0	Do not apply to dry dairy animals within 14 days of freshening. Use only where pyrethroid resistance is not suspected.
	Moxidectin (Cydectin®)	0.5% ready-to-use	0	Zero slaughter withdrawal.

Pesticide Suggestions (Continued)

Pest	Pesticide	Formulation	Minimum days from last application to slaughter	Remarks and safety restrictions
Horn Fly (cont.)	Permethrin (Duraset®)	1%	0	Contains Forapearl.
	(Brute®)	10% pour-on	0	Can use on dairy cows.
	(Boss®)	5% pour-on	0	
	(GardStar®)	40% EC	0	
		10% ear tag	0	Apply 1-2 tags per animal.
	(Ectiban®)	0.25% dust	0	Use at 14-day intervals.
	(Permethrin®)	0.25% dust	0	
	(Permethrin II®)	10% EC	0	Spray at 14- to 21-day intervals.
	(Permethrin CD®)	10% pour-on	0	Ready-to-use.
	(Permethrin CDS®)	7.4% pour-on	0	Ready-to-use.
	(Atroban®)	11 EC	0	Spray at 14- to 21- day intervals.
		10% ear tag	0	Apply 1-2 tags per animal.
	(Ectiban)	5.7% EC	0	Spray at 14- to 21- day intervals.
	Phosmet (Prolate®)	11.6% EC	21	Follow the same restrictions given for cattle grubs in preceding section.
	(GX-118®)			
(Del-Phos®)				
Pirimiphos methyl (Dominador®)	20% ear tag	0	Use 1-2 tags per animal.	
S-cyanomethyl carboxylate (PYthon®)	10% ear tag	0	Use 1-2 tags per animal.	
Stirofos (Rabon®)	50%WP	0	Use 1/2 to 1 gal. dilute spray per animal.	
Stirofos + Dichlorvos (Ravap®)	23.0% + 5.3% EC	0	Beef cattle only. Do not treat more often than every 10 days. Apply as a coarse spray.	
Ticks	Amitraz (Taktic®)	12.5% EC	0	Use 1 quart in 100 gal. water.
	Coumaphos (Co-Ral®)	5.8% LIS 25% WP 42% flowable 11.6% EC	0	Do not apply to dry dairy animals within 14 days of freshening.
	Permethrin (Permethrin II®)	10% EC	0	Use 1/4 to 1/2 gal. per animal; spray at 14- to 21-day intervals.
	(Atroban®)	11% EC	0	Spray at 14- to 21-day intervals.
	(Ectiban®)	5.7% EC	0	Spray at 14- to 21-day intervals.
		0.25% dust	0	Dust at 14-day intervals.
	Stirofos + Dichlorvos (Ravap®)	23.0% + 5.3% EC	0	Beef cattle only. Do not treat more often than every 10 days.

Pesticide Suggestions (Continued)

Pest	Pesticide	Formulation	Minimum days from last application to slaughter	Remarks and safety restrictions
Lice	Amitraz (Taktic®)	12.5% EC	0	Use 1 qt. in 100 gals. water.
	Coumaphos (Co-Ral®)	5.8% LIS	0	Do not apply to dry dairy animals within 14 days of freshening.
		11.6% EC	0	
		1% dust	0	
		42% flowable	0	
	Fenthion (Lysoff®)	7.6 % pour-on	35-40	Do not treat calves less than 3 months old, or sick, convalescent or stressed livestock. Do not treat non-lactating dairy cattle within 28 days of freshening.
			45	
	Avermectin (Ivomec®) (Dectomax®)	0.5% pour-on	48	Do not treat animals within 48 days of slaughter. Do not treat dairy cattle of breeding age. Apply 1 ml. per 22 lbs. of body weight.
		0.5% pour-on	45	
	Milbemycin (Cydectin®)	0.5% pour-on	0	Do not apply to areas caked with snow, mud, manure.
	Permethrin (Permethrin II®)	10% EC	5	Use 1/2 to 1 gal. per animal. Repeat at 2-week intervals. Use 1/2 gal. spray mix per animal. Repeat at 2-week intervals. Ready-to-use. Do not dilute. Apply 1/2 fl. oz. per 100 lbs. body weight, or a maximum of 5 fl. oz. per animal. Spray to thorough coverage; repeat application in 2 weeks.
			5	
		1% pour-on	0	
		5.7% EC	0	
	Avermectin (Ivomec®)	1% injectable	35	Use subcutaneous injection only. 200 micrograms/kilogram of body weight. Not recommended for chewing lice. Subcutaneous or intramuscular injection. Do not treat animals within 35 days of slaughter. 1 ml/110 lbs. of body weight. Do not use on dairy cattle over 20 months of age. Not recommended for chewing lice.
			35	
	Cyfluthrin (Cylence®)	1% pour-on	0	Ready-to-use. 4 ml/400 lbs. of body weight. Maximum of 12 ml. Rub into coat; repeat for lice at 14 days.
		0.25% dust	0	
	Phosmet (Del-Phos®) (Prolate®) (GX-118®)	11.6% EC	21	
		11.6% EC		
	Stirofos + Dichlorvos (Ravap®)	23.0% + 5.3% EC	0	Repeat in 14 days but not in less than 1 week.

Pesticide Suggestions (Continued)

Pest	Pesticide	Formulation	Minimum days from last application to slaughter	Remarks and safety restrictions
Gulf Coast Tick and Spinose Ear Tick	Coumaphos (Co-Ral®)	1% dust 3% spray foam	0	Follow carefully all instructions and precautions on label.
	Fenvalerate (Ectrin®)	8% ear tag	0	Use a tag in both ears.
	Permethrin (Atroban®) (GardStar®)	10% ear tag	0	For beef and dairy cattle. Use a tag in both ears.
	(Permethrin II®)	10% EC	0	Apply 1/2 oz. oil or water mix per ear or 2-4 oz. per face or 12-18 oz. down back line. Read label for preparation of spot-on mixes.
Screwworm and Other Blow Fly Larvae	Treat wounds and surrounding area thoroughly, but do not use excessive amounts. Treat twice first week and weekly thereafter until healed.			
1. Wound Treatment	Coumaphos (Co-Ral®)	1% dust 3% spray foam	0 0	Follow carefully all instructions and precautions on labels.
2. Preventive Spray or Wound Treatment	Coumaphos (Co-Ral®)	25% WP 11.6% ELI 42% flowable	0	Do not apply to dry dairy animals within 14 days of freshening.
Mange and Scab Mites	Amitraz (Taktic®)	12.5% EC	0	Two treatments 7-10 days apart are required for scabies mites.
	Coumaphos (Co-Ral®)	25% WP 42% ELI	0	Repeat in 10 to 14 days.
	Avermectin (Ivomec®)	1% injectable	35	Use subcutaneous injection only. Not for intravenous or intramuscular use. Do not exceed 100 micrograms per kilogram (2.2 lbs.) of body weight. No more than 10 mls. of 1% should be used on animals over 1,000 lbs.
		5% pour-on 1% injectable	48 35	Apply 1 ml. per 22 lbs. of body weight. Subcutaneous or intramuscular injection. 1 ml/110 lbs. of body weight. Do not use on dairy cattle over 20 months of age.
	Milbemycin (Cydectin®)	0.5% pour-on	0	
	Lindane	10% EC	30-60	Can be used as a spray or dip.
	Permethrin (Permethrin II®) (Atroban®) (Ectiban®)	10% EC	0	Spray to run-off; repeat in 2 to 3 weeks.
11 EC		0	Repeat application in 2 to 3 weeks.	
5.7% EC		0	Repeat application in 2 to 3 weeks.	

Pesticide Suggestions (Continued)

Pest	Pesticide	Formulation	Minimum days from last application to slaughter	Remarks and safety restrictions	
Lactating Dairy Cattle					
<p>Note: Dairymen must use good judgment in selection and application of pesticides. Certain materials may be used safely if they are applied correctly, but others are not recommended because they may contaminate the milk. Milk entering interstate commerce can be confiscated by the Environmental Protection Agency if it contains illegal pesticide residues. Consequently, careless use of pesticides may be very costly to the milk producer.</p> <p>One important source of milk contamination with pesticides is hay or forage which the animal consumes. In purchasing baled hay or similar feed material, be sure pesticide residues do not exceed established tolerances.</p>					
Cattle Grub	Milbemycin (Cydectin®)	0.5% pour-on	0		
Lice	Coumaphos (Co-Ral®)	5.8% LIS	0	Follow carefully all instructions and precautions on labels. Spray animals to run-off to achieve coverage. Apply over head, neck, shoulders, back and tail head.	
		11.6% EC	0		
		25% WP	0		
		1% dust	0		
	Milbemycin (Cydectin®)	0.5% pour-on	0		
	Permethrin (Permethrin II®)	10% EC	0	Use 1/2-1 gal. per head of dilute spray; repeat in 14 to 21 days.	
		(Atroban®)	11% EC	0	Use 1/2 gal. per head of dilute spray; repeat in 14 to 21 days.
		(Permethrin CD®)	10% pour-on	0	Ready-to-use.
		(Permethrin CDS®)	7.4% pour-on	0	Ready-to-use.
		(Ectiban®)	5.7% EC	0	Use 1/2-1 gal. per head of dilute spray; repeat in 14 to 21 days.
	0.25% dust	0	Rub into coat; repeat in 14 days.		
Cyfluthrin (Cylence®)	1% pour-on	0	Ready-to-use. 4 ml/400 lbs. of body weight. Maximum of 12 ml.		
Pyrethrins + Synergist	0.03 + 0.25	0	Apply as a fine mist.		
Horn Fly	In addition to dust bags and backrubbers, certain automatic mist sprayers can be used for daily fly control. Consult the product label, local veterinarian, professional entomologist, county Extension agent or supplier representative for methods of using your selected product.				
	Coumaphos (Co-Ral®)	1% dust	0	Carefully follow all instructions and precautions on label.	
	Cyfluthrin (Cylence®)	1% pour-on	0	Ready-to-use. 4 ml/400 lbs. of body weight. Maximum of 12 ml.	
	Milbemycin (Cydectin®)	0.5% pour-on	0		

Pesticide Suggestions (Continued)

Pest	Pesticide	Formulation	Minimum days from last application to slaughter	Remarks and safety restrictions
Horn Fly (Cont.)	Dichlorvos (Vapona®)	21.8% EC	0	Carefully follow all instructions and precautions on label.
	Methoxychlor (Marlate®)	5% dust	0 50% WP	Do not use in conjunction with or following permethrin.
	Permethrin (Atroban®)	10% tag	0	Use 1-2 tags per animal.
	(Brute®)	11% EC	0	
	(Boss®)	5% pour-on	0	Use 1-2 tags per animal.
	(Duraset®)	1% pour-on	0	
	(GardStar®)	10% ear tag 40% EC	0	
	(Permethrin II®)	11% EC	0	Use 1/2 gal. of dilute spray per cow.
	(Permethrin CD®)	10% pour-on	0	Use 1/2-1 gal. of dilute spray per cow. Use no more than 2 oz. per animal; rub into coat.
	(Permethrin CDS®)	7.4% pour-on	0	
	(Ectiban®)	5.7% EC	0	
	(Ectiban® D)	0.25% dust	0	
	(Permethrin®)	0.25% dust	0	
	Pyrethrins + Synergist	0.5% + 5% ready-to-use	0	Apply daily as a mist spray.
Stable Fly & House Fly	Dichlorvos (Vapona®)	21.8%	0	Do not exceed 2 oz. diluted spray mix per animal. Do not contaminate dairy feed.
	Permethrin (Permethrin II®)	10% EC	0	Use 1/2-1 gal. diluted mix per animal.
	(Atroban®)	11% EC	0	Use 1/2-1 gal. diluted mix per animal.
	(Ectiban®)	5.7% EC	0	Spray dilute mix for thorough coverage.
	Pyrethrins (Ortho Dairy and Horse Fly Spray)	spray	0	Apply enough spray to wet ends of hair but not hide.
Screwworm & Other Blow Fly Larvae	Treat wound and surrounding area twice the first week and then weekly until healed.			

Sheep and Nonlactating Goats

Lice, Ticks & Keds	Coumaphos (Co-Ral®)	25% WP	0	Use 0.06% spray or dip for lice or 0.125% for ticks or keds. Do not use on lactating milk goats or dry animals within 14 days of freshening. Agitate dip fluid before using. For spot treatment application.
		5% dust (Keds)	0	
	Diazinon (Dryzon®)	50% W	14	Use as spray or sprinkler can treatment for sheep only.

Pesticide Suggestions (Continued)

Pest	Pesticide	Formulation	Minimum days from last application to slaughter	Remarks and safety restrictions
Lice Ticks & Keds (Cont.)	Fenvalerate (Ectrin) (Vet-Shack®)	10% WDL	0	Apply 2 pts. of 0.025% spray per animal after shearing or up to 4 oz. of a pour-on down backline. Consult label for specific mixing instructions for sprays and pour-ons.
	Lindane	10% EC	30-60	Do not treat milk goats. Do not treat animals less than 3 months old.
	Methoxychlor (Marlate®)	50% WP	0	Apply 0.25% dip or 0.5% spray for lice. Do not apply to lactating milk goats.
		5% dust (lice)	0	Work thoroughly into wool or hair.
	Permethrin (Ectiban®)	5.7% EC	0	Use 1-2 qts. per animal (sheep or goats) of 0.05% spray or 1-2 oz. per animal of the 1 qt. formulation per 2.5 gallons of water mix.
	(DeLice®)	1% ready-to-use	0	Apply 1/2 oz. per 100 lbs. of body wt.
Nose Bots	Avermectin (Ivomec®)	0.08% drench	11	Apply 3 ml per 26 lbs. of body weight as an oral drench.
Screwworm & Other Wound Infesting Larvae	Note: Treat wound twice the first week and then weekly until healed.			
1. Wound Treatment	Coumaphos (Co-Ral®)	1% dust	0	Dust wound and surrounding area thoroughly.
		3% K.R.S spray foam	0	Cover wound thoroughly with foam.
2. Preventive Spray or Wound Treatment	Coumaphos (Co-Ral®)	25% WP	3	Do not use on lactating dairy goats or dry animals within 14 days of freshening. Immerse or spray thoroughly. Repeat as needed.
Fleece-worm or Wool Maggot	Coumaphos (Co-Ral®)	25% WP	3	Do not use on lactating dairy goats or dry animals within 14 days of freshening. Immerse or spray thoroughly. Cover infested area.
		3% spray foam or 1% dust	0	For spot treatment application.

Pesticide Suggestions (Continued)

Pest	Pesticide	Formulation	Minimum days from last application to slaughter	Remarks and safety restrictions
Swine				
Lice	<p>Note: Treat thoroughly; amount depends on animal's size and amount of hair. Do not treat sick or stressed animals. Do not treat for external parasite control and vaccinate on the same day. Repeat application after 2 to 3 weeks.</p>			
	Amitraz (Tactic®)	12.5% EC	1	Mix 1 pint in 25 gals. water.
	Coumaphos (Co-Ral®)	25% WP	0	Spray animal thoroughly.
		11.6% ELI	0	Spray animal thoroughly
		5.8% LIS	0	Do not apply dust more often than every 10 days.
		1% dust	0	Dust may be used simultaneously with 1% dust bedding treatment for severe infestations.
	Fenthion (Tiguvon®)	3% ready-to-use	14	May be used on gestating and lactating sows.
	Fenvalerate (Ectrin®)	10% WDL	1	Wet animals thoroughly; repeat in 14 days if necessary.
	Avermectin (Ivomec®)	1% injectable	18	Subcutaneously inject 1 ml. of material for each 75 lbs. of body weight.
		0.27% injectable		For pigs, subcutaneously inject 0.5 ml. per 10 lbs. of body weight.
	Permethrin (Atroban®)	11% EC	5	Thoroughly soak animal; repeat in 14 days.
	(Ectiban®)	5.7% EC	5	
	(Ectoban®)	0.25% dust	5	Rub into hair; repeat in 14 days.
	Phosmet (Prolate®)	11.6% EC	1	Use 0.125% spray mix only. Wet skin thoroughly using approximately 1 qt. per head on mature animals.
	(GX 118®)			
	(Del-Phos®)			
Sarcoptic Mange Mite	Amitraz (Tactic®)	12.5% EC	1	Spray with a coarse nozzle; mix 1 pt. in 25 gals. water.
	Fenvalerate (Ectrin®)	10% WDL	1	Wet animals thoroughly; repeat at 14-day intervals.
	Avermectin (Ivomec®)	1% injection	18	Subcutaneously inject 1 ml. (cc) for each 75 lbs. of body weight.
	Lindane	10% EC	30-60	Do not treat animals less than 3 months of age. Do not treat sows within 3 weeks after farrowing.
	Phosmet (Prolate®)	11.6% EC	1	Use 0.125% spray mix only. Wet thoroughly using approximately 1 qt. per head on mature animals.
	(Del-Phos®)			

Pesticide Suggestions (Continued)

Pest	Pesticide	Formulation	Remarks and safety restrictions
Horses			
Bots	Dichlorvos (Horse Wormer®)	17.5%	Several formulations are available. Some are for use only by or upon order of licensed veterinarians; others may be administered by owner. Check product label for use restrictions on the particular product.
	Avermectin (Zimecterin®) (Equimectrin®) (Eqvalan®)	1.87% oral paste	Refer to specific instructions on syringe usage.
	Milbemycin (Quest®)	2.0% oral gel	
	Trichlorfon (Combot®)	40% oral paste 12.3% liquid	Do not treat foals less than 4 months old or mares in last month of pregnancy. Do not treat sick or debilitated horses. Do not treat horses to be used for food. Single oral dose in feed 1 month after killing frost. Do not repeat within 30 days.
Lice, Horn Fly, Stable Fly, Ticks & Mosquitoes	Numerous products are available for use. The following list includes examples.		
	Coumaphos (Co-Ral®) Spray	11.6% ELI 5.8% LIS 42% flowable 1% dust (horn fly) 3% spray (horn fly)	Do not treat animals less than 3 months old. Do not treat sick or stressed animals. Do not use in conjunction with oral drenches or other internal parasite medications or with pyrethroids or their synergists or other organic phosphates. Repeat as necessary. Dust lightly in ears for ticks. For screwworms, treat wound thoroughly. Cover thoroughly. Spray wound.
	Fenvalerate (Ectrin®)	10% WDL	Apply 8 oz. of mix per animal as a light spray. Do not treat animals for slaughter.
	Pyrethrin + (Repel-X®) (Wipe®)	ready-to-use ready-to-use	Repeat as necessary. For horn flies and mosquitoes.
	Permethrin (Atroban®) (Permethrin II®) (Ectiban®) (GardStar®)	11% EC 10% EC 11% EC 40% EC	Wet horses thoroughly. Sponge animal thoroughly with 2 qts. of mix.
	Stirofos + Pyrethrin + Piperonyl butoxide	1.27% ready-to-use	Repeat as necessary. For horn flies and mosquitoes.

Pesticide Suggestions (Continued)

Pest	Pesticide	Formulation	Minimum days from last application to slaughter	Remarks and safety restrictions
Poultry				
House Fly & Soldier Fly	Cyromazine (Larvadex®)	1% premix	3	Labeled for house fly only. Use as a feed additive to control house fly larvae in manure. Follow label directions.
	Carbaryl (Sevin®)	1% dust	7	Use 1 lb. of 5% dust per 100 birds or 1.2 oz. of 50% WP in 1 gal. of water per 100 birds. Bird treatment is used as a supplement to roost and building treatment. Use 1 lb. per 40 square feet of floor, roost or interior surface. Treat litter evenly and thoroughly. Mix evenly in top layer of dust box contents. Use 2.5 lbs. of 5% dust per 50 birds in an 18x12x3-inch dust box.
		5% dust	7	
		50% WP		
		5% dust (litter) 5% dust box	7 7	
	Permethrin (Permethrin II®) (Atroban®) (Ectiban®)	10% EC	0	Use 1-2 oz. per bird; cover vent thoroughly. Apply to birds thoroughly, particularly to vent. Use 1 gal. spray per 100 birds; cover vent areas thoroughly. Dust thoroughly around vent of each bird.
		11% EC	0	
		5.7% EC	0	
		0.25% dust	0	
	Stirofos + Dichlorvos (Ravap®)	23% WP + 5.3% EC	1	Spray vent and fluff areas with 0.6% spray. Do not repeat more often than every 14 days.
Fowl Tick	Carbaryl (Sevin®)	50% WP	7	Treat roosts and buildings only.
		80 S	7	
	Stirofos (Rabon®)	50% WP	0	Apply 1% spray to walls, ceiling, floor cracks and crevices.
	Stirofos + Dichlorvos (Poultry Spray & Larvicide®)	23% WP + 5.3% EC	0	Thoroughly cover walls, ceilings, cracks and crevices with 1.25% spray.

Pesticide Suggestions (Continued)

Pest	Pesticide	Formulation	Minimum days from last application to slaughter	Remarks and safety restrictions
Northern Fowl Mite	Carbaryl (Sevin®)	5% dust	7	Use 1 lb. per 100 birds. Do not contaminate feed or drinking water. Bird treatment is used as a supplement to roost and building application. Do not repeat application within 4 weeks. Use 2.5 lbs. of 5% dust per 50 birds in an 18x12x3-inch dust box. Refer to labels for specific instructions and precautions.
		5% dust (dust box)	7	
		50% WP	7	
		80 S	7	
	Stirifos (Rabon®)	50% WP	0	For birds in wire cages or on floor, use 1 gal. of 0.5% spray per 100 birds or 1 oz. per bird. For caged birds, apply to vent and fluff areas from below. For floor-managed birds, spray birds lightly while treating litter surface. Repeat as necessary, but not more often than every 14 days. and/or For litter treatment, use 1 to 2 gals. of 0.5% spray per 1,000 sq. ft. Apply to litter, walls, roosts, cracks and crevices. and/or Use 1 pt. of 1% mix per 100 ft. of roost. Dust 2.5 oz. per 100 sq. ft. of litter. Treat litter evenly and thoroughly. and/or Use 2.5 oz. per 50 birds. Mix evenly in top layer of dust box contents.
			0	
		50% WP	0	
		50% WP	0	
		0		
	Permethrin (Ectiban®)	5.7% EC	0	1 qt. to 25 gals. of water. Use 1 gal. spray per 100 birds, paying particular attention to vents. 1 pt. to 25 gals. of water. 1 qt. to 50 gals. of water. Use 1-2 oz. per bird or 1 gal. per 100 birds directed to vent areas. 1-4 fl. oz in 3.75 gals. of water.
0				
(Atroban®)		11%	0	
(Permethrin II®)		10% EC	0	
	(GardStar®)	40% EC	0	
Chiggers Infesting Area	Chlorpyrifos (Dursban®)	50W		Do not apply directly to turkeys. Spray soil in pens using 100-150 gals. of water per area.
Depluming Mite	Sulfur Dust	Elemental sulfur		Use 25-50 lbs. of elemental sulfur per area.
	Sulfur-soap mixture	2 oz. sulfur and 1 oz. soap in 1 gal. water	0	Dip birds thoroughly, wetting feathers.

Pest	Pesticide	Formulation	Procedures for application	Remarks and safety restrictions
Premises (Inside or outside of animal quarters)				
House Fly Stable Fly	Cyfluthrin (Countdown®) Diazinon®	20% WP 50% WP	Cover total area Cover resting areas thoroughly	For "crawling and flying" pests. Remove animals from buildings prior to spraying. Keep them out for at least 4 hours.
	Dichlorvos (Vapona®) (Feedlot®)	21.8% 40.2% 18.6% pest strip	Direct 0.5%-1.0% Mist over entire area where flies congregate One strip per 1,000 cubic ft.	Avoid direct application to exposed feed and water. Do not use where milk is processed. Do not use during milking time when milk and utensils may become contaminated. Most effective in spaces with little air movement.
	Dimethoate (Cygon®)	23.4% EC	Thoroughly spray interior and exterior surfaces	Remove animals from building before spraying. Do not apply to milk rooms.
	Fenvalerate (Ectrin®)	10% WDL	Apply to fly resting areas	Do not contaminate feed or water.
	Lambda-cyhalothrin (Grenade®)	10% WP	Mix with water for treatment	Do not contaminate feed or water.
	Methoxychlor (Marlate®)	50% WP	Cover resting surfaces thoroughly with 2.5-5% spray	Remove dairy cattle from building prior to spraying.
	Methomyl (Golden Malrin®) (Apache®)	ready-to-use bait	Scatter in fly breeding areas	Do not use in poultry operations except with caged layers.
	Permethrin (Atroban®)	11% EC 25% WP	Apply to fly resting areas	Do not contaminate feed or water.
	(Permethrin II®)	10% EC	Apply to fly resting areas	Do not contaminate feed or water.
	(Ectiban®)	5.7% EC 25% WP	Apply to fly resting areas	Do not contaminate feed or water.
	(GardStar®)	40% EC	Apply to walls and resting areas	
	Stirofos (Rabon®)	50% WP	Apply 1% spray to ceilings and walls to the point of run-off	Do not contaminate feed, water, utensils or equipment.
	Stirofos + Dichlorvos (Ravap®)	2.3% +5.3%	Apply 1.25-2.5% spray to surfaces to the point of run-off	Formulation and dosage will vary with the type of surface.

Insecticides and Corresponding Trade Names

Chemical Name	Trade Name	Chemical Name	Trade Name
Amitraz	Taktic®	Lindane	Lindane
Avermectin	Ivomec® Zimectin® Eqvalan® Dectomax® Eprinex®	Lime-Sulphur Methomyl	Lime-Sulphur Golden Malrin® Apache®
Carbaryl	Sevin®	Methoxychlor	Marlate
Chlorpyrifos	Sevin® Dursban®	Moxidectin	Cydectin® Quest®
Coumaphos	CoRal® Spray Foam	Pyrethrin	Repel® Wipe® LD-442
Cyfluthrin/Chlorpyrifos	Max Con®	Permethrin	Permethrin II® Atroban® GardStar® Insecta-Gard® De-Lice® Duraset® Brute® Permethrin 10® Permethrin CD® Permethrin CDS® Stock-Tox-X®
Diazinon	Cutter Gold® Cylence® Cutter 1® Patrol® Warrior®	Pirimiphos-methyl	Dominator®
Dichlorvos	Horse Wormer® Vapona®	Phosmet	GX-118® Prolate® Del-Phos® Lintox HD®
Dimethoate	Cygon®	S-Cyanomethyl Carboxylate	PYthon®
Dormectin	Dectomax®	Stirofos	Rabon®
Ethion	Commando®	Stirofos + Dichlorvos	Ravap®
Famphur	Warbex® Cutter Blue® Lysoff® Spotton® Tiguvon®	Trichlofon	Combot®
Fenvalerate	Ectrin® Ear Tag Plus®		
Lambda-cyhalothrin	Saber® Grenade®		
Lambda-cyhalothrin/ Pirimiphos methyl	Double Barrell®		

The information given herein is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Cooperative Extension Service is implied.

Policy Statement for Making Pest Management Suggestions

The information and suggestions included in this publication reflect the opinions of Extension entomologists based on field tests and use experience. Our management suggestions are a product of research and are believed to be reliable. However, it is impossible to eliminate all risk. Conditions or circumstances which are unforeseen or unexpected may result in less than satisfactory results even when these suggestions are used. The Texas Agricultural Extension Service will not assume responsibility for such risks. Such risks shall be assumed by the user of this publication.

Suggested pesticides must be registered and labeled for use by the Environmental Protection Agency and the Texas Department of Agriculture. The status of pesticide label clearances is subject to change and may have changed since this publication was printed. County Extension agents and appropriate specialists are advised of changes as they occur.

USERS are always responsible for the effects of pesticide residues on their livestock and crops, as well as problems that could arise from drift or movement of the pesticide from their property to that of others. Always read and follow carefully the instructions on the container label.

Other information

For additional details on livestock parasites, refer to the following Texas Agricultural Extension Service publications, available from your county Extension agent.

B-1088 Poultry Pest Management
B-6063 The Livestock Insecticide Label Notebook (For sale only).

The information given herein is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Texas AgriLife Extension Service is implied.

Produced by AgriLife Communications and Marketing, The Texas A&M University System
Extension publications can be found on the Web at: <http://AgriLifeBookstore.org>.
Visit Texas AgriLife Extension Service at <http://AgriLifeExtension.tamu.edu>.

Educational programs of the Texas AgriLife Extension Service are open to all people without regard to race, color, sex, disability, religion, age, or national origin.

Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of Congress of May 8, 1914, as amended, and June 30, 1914, in cooperation with the United States Department of Agriculture. Edward G. Smith, Director, Texas AgriLife Extension Service, The Texas A&M University System.