

ANIMALS

PETS (Companion Animals) EXTERNAL PARASITE CONTROL

Nancy Hinkle, Extension Veterinary Entomologist

Numerous external parasites infest our pets. Dogs and cats can become infested with fleas, ticks and mange mites and pet birds with mites and lice. Often these parasites infest our homes and yards. Thus control measures should focus on the infested pet and the pet's roaming area as well.

Pet owners should seek professional advice and assistance from Veterinarians, Professional-Licensed Pest Control Operators and University Extension Agents when dealing with external parasite control on pets and the home environment. This will help prevent problems when using chemicals to treat pets, as well as indoor and outdoor areas. Pets can be poisoned and even killed by external parasiticides if they are used improperly. Rugs, carpets and home furnishings can be damaged by the improper use of insecticides. Humans can be allergic to external parasiticides used on pets and insecticides used in the home. For these reasons, when treating pets and the home environment, one should always seek professional advice and adhere to instructions provided on drug and insecticide labels.

Many of the insecticides listed in this section will control or aid in control of other external dog parasites and offer temporary relief from flies. Mites are difficult to control and only those products labeled for mites can be expected to provide acceptable results. Only those insecticides that have labels specifically permitting feline treatment can be used to treat cats; exercise extreme caution when treating cats to avoid toxicity. See Household Pest Control section for recommendations on treating indoor flea infestations.

DOGS AND CATS – EXTERNAL PARASITE CONTROL

Common Name (Trade Names)	Parasite Controlled	Formulation	Indoor	Pets	Outdoor
allethrin (SP)	fleas, ticks	Aerosol Shampoo	X	X	
amitraz (Preventic Tick Collar, Mitaban) ¹	fleas, mites	Collar Dip		X ² X ²	
carbaryl (Sevin) (CR)	fleas, ticks, lice	Shampoo Dust	X	X X	X
d-limonene (Flea and Tick Spray, Dip and Shampoo) (BOT)	fleas, ticks	Aerosol Dip Shampoo	X	X X X	
deltamethrin (SP)	fleas, ticks	Collar		X ²	
flupronil (Frontline) ¹	fleas, ticks	Spot-on Spray		X X	
imidacloprid (Advantage) ¹	fleas	Spot-on		X	
ivermectin ¹	mites	Suspension		X	
limonene (BOT)	fleas Spray	Shampoo Dust	X	X X	
linalool (BOT)	fleas, ticks Dust	Spray Dust	X X	X	
lufenuron (Program, Sentinel) ¹ (IGR)	fleas	Suspension Tablet Injection	X	X X X	
methoprene (Precor) (IGR)	fleas, ticks	Aerosol Spot-on Shampoo Collar Emulsifiable concentrate (Spray) Spray	X X X	X X X X	
milbemycin oxime (Milbemite) ¹	mites	Suspension		X	
nitfenpyram (Capstar) ¹	fleas	Tablet		X	

PETS (Companion Animals) EXTERNAL PARASITE CONTROL (continued)

Common Name (Trade Names)	Parasite Controlled	Formulation	Indoor	Pets	Outdoor	
permethrin (SP)	fleas, ticks, lice, mites	Aerosol	X			
		Spot-on		X ²		
		Emulsifiable concentrate (Spray)	X			
		Shampoo		X ²		
		Spray		X ²		
phenothrin (SP)	fleas, ticks	Shampoo		X ²		
		Fogger	X			
		Collar		X		
		Spot-on		X ²		
		Spray	X			
propoxur (Sendran) (CR)	fleas	Collar		X		
pyrethrins + piperonyl butoxide (NP) (BOT)	fleas, ticks, lice	Spray	X	X		
		Shampoo		X		
		Dip		X		
			Emulsifiable concentrate (Spray)	X		
			Dust		X	
		mites	Fogger	X		
		Suspension		X		
pyriproxyfen (IGR)	fleas, ticks	Spray	X			
		Collar		X		
		Shampoo		X		
		Spot-on		X		
		Fogger				
resmethrin (SP)	fleas	Spray		X		
		Emulsifiable concentrate (Spray)	X			
		Shampoo		X		
rotenone ¹ (BOT)	mites	Spray		X ²		
		Suspension		X		
		Cream		X ²		
selamectin (Revolution) ¹	fleas, ticks, mites	Spot-on		X		
tetrachlorvinphos (OP)	fleas	Collar		X		
		Fogger	X			
tetramethrin (SP)	fleas	Spray	X			

PET BIRDS (mites, lice, fleas)

carbaryl (Sevin) (CR)	Dust	X	X
pyrethrins + piperonyl butoxide (many available) (NP)	Aerosol	X	X

¹ Some formulations for veterinary application or prescription only.

² Treat dogs only.

Abbreviations: CR - carbamate, IGR - insect growth regulator, INO - inorganic, NP - natural pyrethrins, OP - organophosphate, SP - synthetic pyrethroid.

FLEA CONTROL PRODUCTS

Nancy Hinkle, Extension Veterinary Entomologist

Adult fleas spend their entire lives on the dog or cat. As they are laid, flea eggs fall off the animal and collect in the environment (carpet or dirt). Flea larvae emerge from eggs within a couple of days and crawl around, eating their parents' feces. In about two weeks, the larva has completed its development and is ready to spin a cocoon within which it will change into an adult. Once this metamorphosis has taken place, the adult flea remains within the cocoon until it is stimulated to emerge. If a host is not present, an unemerged flea can remain within its cocoon for months, allowing a flea infestation to persist for long periods without an animal around. Cues that signal a nearby host include movement, heat, and carbon dioxide (exhaled by all mammals). Upon detecting one of these stimuli, the flea bursts from the cocoon and hops toward the host. It repeatedly flings itself against the host until its claws catch. To avoid being groomed off or knocked loose, the flea burrows into the host's coat. Adult fleas must suck blood once an hour, so never leave the host. Once on the host, fleas live for two or three weeks.

Fleas can live on wild animals such as opossums, raccoons, foxes, skunks, etc., so it is important to discourage wild animals from visiting your yard and sharing their fleas. Do not leave pet food outside at night, and seal garbage cans to prevent attracting wildlife. Screen openings to crawl spaces and do not allow wild animals to den under the house, in the attic, or in outbuildings.

Because flea eggs, larvae, and pupae are dispersed in the environment, they are very difficult to control. Daily vacuuming helps suppress fleas indoors. The most efficient flea control method is to treat the host (dog or cat) and kill adult fleas before they can reproduce. Pets should be treated early in the spring, before fleas become a problem, to prevent large populations becoming established in the environment. Over-the-counter products, while less expensive, do not contain the same ingredients as those obtained through veterinarians and may be more toxic. Always read and follow label directions. Pesticides can sicken or kill pets and people if used incorrectly.

HOST-APPLIED FLEA PRODUCTS						
Product	Manufacturer	Active Ingredient	Formulation	Dosage	Pet	Effective Against
Advantage	Bayer	Imidacloprid	Topical Spot-on	Once/mo.	Dogs & Cats	Fleas
Advantix	Bayer	Imidacloprid and Permethrin	Topical Spot-on	Once/mo.	Dogs	Fleas, Ticks, Mosquitoes
Capstar	Novartis	Nitenpyram	Tablets	Once/day	Dogs & Cats	Fleas
Comfortis	Lilly	Spinosad	Tablet	Once/mo.	Dogs	Fleas
Frontline	Merial	Fipronil	Topical Spot-on Spray	Once/mo. Once/mo..	Dogs & Cats Dogs & Cats	Fleas, Ticks Fleas, Ticks
Program	Novartis	Lufenuron	Tablets Liquid Injectable	Once/mo. Once/mo. Once/mo.	Dogs & Cats Cats Cats	Fleas (immatures)
Revolution	Pfizer	Selamectin	Topical Spot-on	Once/mo.	Dogs & Cats	Fleas, Ear Mites, Heartworm, Intestinal Worms
Sentinel	Novartis	Milbemycin oxime and Lufenuron	Tablets	Once/mo.	Dogs	Fleas (immatures), Heartworm, Intestinal Worms
Vectra 3D	Summit VetPharm	Dinotefuran, permethrin and pyriproxyfen	Topical Spot-on	Once/mo.	Dogs	Fleas, Ticks, Mosquitoes
Vectra	Summit VetPharm	Dinotefuran, pyriproxyfen	Topical Spot-on	Once/mo.	Cats	Fleas

HONEY BEE DISEASE AND PEST CONTROL

Keith S. Delaplane, Extension Entomologist

PEST	MATERIAL AND FORMULATION	RATE	REMARKS AND PRECAUTIONS
American foulbrood (AFB)	Terramycin	Operator-mixed formulations of Terramycin Soluble Powder are no longer labeled for beekeeping use. However, the same active ingredient (oxytetracycline) is available for beekeeping use in several pre-formulated products, including Tetra Bee Mix (Dadant & Sons), Terra-Pro (Mann Lake Ltd.), and Terramycin Pre Mix (Brushy Mountain). Use only according to label directions.	Antibiotics are strictly for <u>preventing</u> disease. Treat in February and September and never within 4 weeks of a marketable nectar flow. Diseased colonies must be burned. Dig a pit and burn all bees, combs, and frames. Bottom boards, supers, and lids can be salvaged by scorching their interiors. With medicated extender patties, remove all uneaten portions after 4 weeks of treatment and never treat within 4 weeks of a marketable nectar flow. The use of genetically AFB - resistant queens expressing hygienic behavior can reduce or eliminate the need for antibiotic treatments.
	Tylosin	Honey bee colonies should receive three treatments administered as a dust in confectioners/powder sugar. Mix 200 mg tylosin in 20 g confectioners/powdered sugar. The 200 mg dose is applied (dusted) over the top bars of the brood chamber. Apply 3 single doses, each one week apart. For use in limited amounts, mix 1 tablespoon with 2 boxes (1.93 lbs.) of powdered sugar. This will provide treatment for 44 colonies with single doses or 15 colonies with 3 doses (for a complete treatment)	
Chalkbrood	None		Keep hives well ventilated. Prop lid slightly to exhaust warm, damp air. Lean hive forward to drain rain water from interior. Use hygienic selected bee stock.
European foulbrood (EFB)	Terramycin Tylosin	Same as for American foulbrood	Drug is for preventing and treating disease. Treat in February and September and never within 4 weeks of a marketable nectar flow. Help infected colonies by adding unsealed brood and feeding 1 : 1 sugar syrup. Use hygienic - selected bee stock.
Nosema	Fumagilin B	Dissolve 1 teaspoon of Fumagilin B in 1.1 gallons of sugar syrup.	Feed medicated syrup in spring and fall and never immediately before a marketable nectar flow. Keep hives well ventilated. Prop lid slightly to exhaust warm, damp air. Lean hive forward to drain rain water from interior.
Small Hive Beetles	2. Permethrin (GardStar 40% E.C.) 3. Predatory soil nematodes especially <i>Heterohabditis indica</i> (Southeastern Insectaries, Perry, GA).	1. <u>For treatment inside colonies:</u> Adult beetles can be trapped and drowned in vegetable oil with any of the numerous in-hive adult beetle traps available by bee suppliers. 2. <u>For treatment outside colonies:</u> Mix 5 ml GardStar concentrate with 1 gal water. Thoroughly wet ground in an area 18-24 in. wide in front of each hive (1 gal per 6 hives). 3. <u>For treatment outside colonies:</u> Mix 1 million infective juveniles in 2 gal. water per colony. Strain out gelatin globules and trickle solution on ground in front of hive. Treat ground under hive if screen bottoms are used.	2. <u>GardStar:</u> Product is designed to kill immature beetles when they leave hive in order to pupate in the soil. Product is highly toxic to bees. Avoid direct spray onto hive surfaces. Apply in late evening after bees become inactive. For pre-placement cleanup of new apiary site, apply thoroughly to ground surface 24-48 hours prior to hive placement. 3. <u>Management:</u> Predatory nematodes have been shown to effectively kill SHB pupae in soil in front of hives.

HONEY BEE DISEASE AND PEST CONTROL (continued)

PEST	MATERIAL AND FORMULATION	RATE	REMARKS AND PRECAUTIONS
Tracheal mites	menthol	one 1.8 oz. packet per colony	Do not use on hives containing marketable honey. Enclose 1.8 oz. menthol in a 7-inch square plastic (or other porous) screen packet. Treat colonies in fall and early spring and only when daytime highs range from 60°-90° F. If daytime high is > 80° F., place packet on bottom board. If daytime high is 60°-79° F., place packet on top bars. Replace menthol as needed. Remove all menthol 10-12 weeks after first treatment and at least 1 month before nectar flows. Vegetable oil such as in the medicated extender patty described above for AFB and EFB helps control tracheal mites.
	oil patties	Mix patties with 2 parts sugar: 1 part vegetable cooking shortening. Each patty should be 0.5 lb.	Place oil patty on top bars of brood frames. Spring treatments (February-April) are most effective.
Varroa mites	<p>1. fluvalinate (Apistan)</p> <p>2. coumaphos (CheckMite+ Strip)</p> <p>3. Apiguard</p>	<p>1 strip for each 5 combs of bees in each brood chamber</p> <p>1 strip for each 5 combs of bees in each brood chamber</p> <p>1 tray per colony, repeated after 2 weeks</p>	<p>Treatable threshold for varroa mite is 60-180 mites recovered in one 24-hour exposure with a bottom board sticky sheet, without use of miticide.</p> <p>1. Apistan: Do not use on hives containing marketable honey. Hang one strip between frames 3 and 4, and another strip between frames 7 and 8. Leave strips in hive for 42 to 56 days. Apistan treatments are usually most effective if given in early fall. Supplement Apistan with Terramycin treatments as described above for AFB.</p> <p>2. CheckMite: Hang the strips within two combs of the edge of the bee cluster. If two deep supers are used for the brood nest, hang CheckMite+ Strips in alternate corners of the cluster, in the top and bottom super. Remove honey supers before application of CheckMite+ Strips and do not replace until 14 days after the strips are removed. Treat all infested colonies within yard. The treatment is most effective when brood rearing is lowest. Do not treat when surplus honey is being produced. Leave the strips in the hive for at least 42 days (six weeks). Do not leave strips in hive for more than 45 days. Do not treat more than twice a year for varroa mites.</p> <p>3. Apiguard: Open the hive. Peel back the foil lid of the APIGUARD tray leaving one corner of the lid attached to the tray. Place the open tray centrally on top of the brood frames, gel side up. Ensure that there is a free space of at least 0.5-inch between the top of the tray and the hive cover board, for example, by placing an empty super on top of the brood box. Close the hive. After two weeks replace the first tray with a new one, according to the same instruction. Leave the product in the colony until the tray is empty. Remove the product when installing the supers on the colony.</p> <p>The efficacy of APIGUARD is maximized if the product is used in late summer after the honey harvest (when the amount of the brood present is diminishing). However, in the case of severe infestations, APIGUARD can also be used during springtime, when temperatures are above 60° F. Efficacy will vary between colonies due to the nature of the application. Therefore, APIGUARD should be used as one treatment among others within an Integrated Pest Management program, and mite fall regularly monitored. If further significant mite fall is observed during the following winter or spring, use an additional secondary winter or spring treatment for varroa.</p>

