

Always follow label instructions. Label instructions could change before you receive a revision of this publication. The label is the law. Be sure to observe all precautions on insecticide labels to prevent injury to animals and humans and to prevent illegal insecticide residues in beef and beef by-products.

Insecticides to Use and Ways to Apply them to Control Beef Cattle Pests

Beef

Insect and Insecticide	Min. Days from Last Application to Slaughter	Formulation & Strength	Amount of Formulation Per Animal or Area	Where and When to Apply Precautions (by nos. below) See Safety Restrictions
CATTLE GRUBS (Use one only once from late July to no later than Nov. 1. Lice & Horn fly control results with sprays & pour-ons also)				
Coumaphos (Co-Ral)	0	Spray or dip 25 WP: 8 lbs/100 gals H ₂ O 4% Pour-on: Ready to use 11.6% EC: 10 ozs/4 gals water 42% FL: 1 gal/100gals water 5.8% EC: 20oz/4gals water	Depending on size of animals and amount of hair	Wet entire body to skin with high pressure spray (200-400 psi). Treat during early summer for grub control and no later than 6 weeks prior to expected appearance of grubs in the back (no later than Nov. 1). Do not apply to sick, convalescent or stressed livestock or to animals less than 3 months old. Do not spray animals for 10 days before or after shipping or weaning, or after exposure to contagious and infectious diseases. Do not spray in a confined, non-ventilated area. Do not apply in conjunction with oral drenches or other internal medications nor with natural pyrethrins or synthetic pyrethroids or their synergists or with other cholinesterase inhibitors. Apply a wetting spray or immerse animal. Dip only once for grubs. Spray as needed for wound infesting larvae. Keep dip vat charged and agitated. Make dips with WP formulations only. Waiting period: 0 days. Apply pour-on solution at rate of 1/2 fl oz per 100 lbs animal body weight. Apply evenly along backline. Restrictions same as above.
Famphur (Warbex)	35	13.2% Pour-on Ready to use	1/2 oz/100 lbs up to a maximum of 4 ozs	Pour on evenly along animal's backline. Treat during Sept. or Oct. for maximum control but no later than Nov. 1. Pour along backline. Do not treat calves 3 months old. Do not treat cattle not previously treated for grubs during Nov., Dec., Jan., and Feb. Do not treat Brahman bulls. Famphur is a cholinesterase inhibitor. Do not use any drug, pesticide or other chemicals having cholinesterase inhibiting activity either simultaneously or within a few days before or after treatment.
Fenthion (Spot-on) (Tiguvon)	45	20% Spot-on Ready to use	150-300 lbs 4 cc 301-600 lbs 8 cc 601-900 lbs 12 cc 901-1,200 lbs 16 cc 1,201 & above 20 cc	Apply in one spot on back. Apply with syringe or other applicator adapted for this use. 1
Ivermectin (Ivomec)	35	1% Ready to use	1 ml (10 mg Ivermectin) per 110 lbs body weight	Restrain animals and inject under the loose skin in front of or behind the shoulder. A sterile, 16-gauge, 1/2 to 3/4 inch needle is suggested. Divide doses greater than 10 ml between two injection sites.
Injection				
Pour-on	48	5 mg Ivermectin/ml Pour-on	1 ml/22 lbs body wt	Apply along the topline in a narrow strip extending from the withers to the tailhead.
SR Bolus	180	1.72 gms ivermectin / bolus	1 bolus to cattle between 275 lbs & 660 lbs	Use a balling gun to administer. Calves must be ruminating and greater than 12 weeks of age.
Eprinomectin (Ivomec)	35	5 mg eprinomectin / ml, Pour on, ready-to-use	1 ml. / 22 lbs body wt.	Apply pour-on to the top of the animal along the backline from the withers to the tailhead.
	35	3% Pour-on Ready to use	1/2 oz/100 lbs	Pour along backline. Do not re-treat within 35 days. Retreat for lice after 35 days, if needed. 1
CATTLE GRUBS (cont'd)				

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Trichlorfon (Neguvon)	21	8% Pour-on solution Ready to use	1/2 fl oz/100 lbs body wt	Pour on evenly along animal's backline. For best grub control results, treat during early summer and no later than 6 weeks before the expected appearance of the grubs in the animal's back. Do not apply in conjunction with oral drenches, other internal medications or other organophosphate insecticides. Do not treat animals less than 3 months of age. Do not treat sick convalescent or stressed livestock. Do not treat animals for 10 days before or after shipping or weaning or after exposure to contagious or infectious diseases.
	21	Soln., 8% (Ready to use backline pour-on)	1/2 fl oz/100 lbs body weight; no more than 4	Pour on evenly along animal's backline. 2,5
FACE FLY (Face and Backrubbers give horn fly, lice, and some grub control if grub material used)				
Coumaphos (Co-Ral)	0	11.6% EC (1% oil)	1 1/4 cups/gal of #2 diesel fuel or #2 furnace oil 1 gal/20 ft cable	Saturate face/backrubbers; construct backrubbers to permit animal to rub face. See UT Pub. 658, Mineral Box and Face Fly Duster, for face duster construction plan. 3
		5% D	8 lbs/dust bag	
Cylen ce	0	1 % Pour-on	4 ml. to animals weighing less than 400 lbs. 8 ml. to animals weighing 400-800 lbs. 12 mls. to animals weighing over 800 lbs.	Apply pour-on along the top of the back and top of the head. Do not retreat within three weeks following treatment. Double the dose for biting and sucking lice.
dichlorvos (Vapona)	1	21.8% EC 1 qt. / 6 gals. water	1-2 fl ozs/animal/day	Apply as a fine mist. Spray to cover all parts of the animal. Do not wet the skin. Do not apply more than 2 fl ozs per animal each day.
Delice Atroban / Synergized Expar	0	1.0 % Pour-on Ready-to-use	0.5% fl. oz. (15cc) per 100 lbs. body weight, up to 5 fl. oz. for one animal.	Pour correct dose along back and down face.
Malathion	0	57 % EC	2/3 cup / 1 gal. #2 diesel fuel	Apply 1 gal. per 20 ft. cable. Keep backrubber charged.
Methoxychlor	0	24% EC	1 qt/gal of #2 diesel fuel	1 gal/20 ft cable. Keep backrubber charged.
Permethrin	0	25% Dust Ready to use		Use in dust bags or apply up to 2 oz directly to animals.
	0	5.7% EC 10% EC	1 qt/100 gal water 1 pt/100 gal water (1% pour-on as an undiluted spray)	Spray animal thoroughly. Retreat as needed but not more than once every 14 days. To control lice or mites, a second treatment may be needed 14 - 21 days later.
	0	42.5% EC	1 cup / 100 gals. water or 1 pt. / 100 gals water	Apply 2 qt. of high concentration spray mixture per animal to control all labeled parasites. Repeat treatment as needed but not more than every 14 days.
FACE FLY (Cont'd)				

Beef

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Permethrin (cont'd)	0	5.7% EC, 1 qt./ 10 gals. diesel 10% or 11 % EC, 1 pt./1 gal. #2 diesel 40% EC, 118 ml ./ 10 gal. diesel		Keep rubbing device charged. Daily forced use provides best results.
Phosmet (Prolate, Lintox)	0	1% D	Ready to use	Self-treating dust bags. Apply in forced use or free choice use dust bags. Best results are obtained where cattle use these devices daily. Hand-Dusting: Apply 1 oz of dust per animal for flies and 1/2 oz for lice. Use less on smaller and younger animals. Apply to upper portions of back, neck and poll and rub in lightly. Repeat as necessary.
Pyrethrins + Synergist		Oil soln.	1-2 fl ozs	As mist spray daily to head and neck, with hand or automatic sprayer. Use as purchased.
Stirofos (Rabon) Oral Larvicide		7.76 G Pre-mix or ready-to- use blocks & mineral feeds.	70 mg/100 lbs body weight daily.	Mix 7.76 % oral larvicide with concentrate feed as directed on label. Feed ready-to-use block or mineral free choice so each animal will consume recommended daily amount. Begin feeding before flies appear in spring. Feed continuously until frost. Must be supplemented to provide effective control.
Stirofos + dichlorvos (Ravap 28.7%)	0	5 oz. / 1 gal. #2 diesel fuel	1 gal/20 ft cable	Keep rubbing device charged.
	0	1% Rabon 0.25% Vapona Ready to use	1 gal/20 ft cable	
Stirofos (Rabon) Dust Bag	0	3% D	See package label.	Use in dust bag face/backrubbers. Apply 2 oz of dust per animal by hand or duster.
stirofos + dichlorvos (Ravap)	0	28.7% EC	5 oz/gal #2 diesel fuel	1 gal/20 ft cable. Use a rubbing device charged.
cyfluthrin (Cutter Gold)		10%	1 tag on each ear	Attach when flies build up. Remove tags at end of season and before slaughter.
diazinon (Terminator)		20%		
(Bova Gard)		20%		
(Patriot)		40%		
(Optimizer)		21.4%		
(Optimizer - Calf)		21.4%		
(Cutter - 1)		40%		
diazinon + chlorpyrifos (Warrior)		30% 10%		
Ethion (Commando)		36%		
fenthion (Cutter Blue)		20%		

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FACE FLY (Cont'd)		EAR TAGS		
fenvalerate (Ectrin)		10%		
flucythrinate (Guardian)				
Lambda-cyhalothrin (Saber) (Excalibur)				
permethrin (Insecta-Gard, Gard Star, Ear Force, Atroban)		10%		
pirimiphos-methyl (Dominator) (Rotator) (Tomahawk)		20%		
Rabon		13%		
Zetacypermethrin + piperonyl butoxide (Python) (Zetagard)		10% 20% 10% 10%		
HORN FLY (Horn fly and grub controls aid face fly control)				
Chlorpyrifos (Dursban)		43.2 % spot-on	2 cc/100 lbs animal up to 800 lbs	Apply spot-on to one spot at the top midline area of the animal just behind the shoulder blades and neck junction. Use specially adapted applicator to allow exact treatment. Wear rubber gloves and apply in a well ventilated area. Never use over 16cc/animal. Do not treat any bulls over 8 months of age. Do not treat any dairybreed cattle. Do not treat purebred continental or exotic breed cattle such as Simmental, Chianina, Charlais or Gilbvieh. Do not treat cows 21 days prior to calving or for 14 days after calving. Do not treat veal calves. Do not treat beef-breed calves under 12 weeks of age. Do not treat sick, convalescent or severely stressed animals. Do not treat cattle for 10 days before or after shipping, dehorning, castration, vaccination, etc. Do not slaughter animals within 14 days of initial treatment. If retreatment is needed, follow this schedule: (1) Retreat 45 days after initial treatment with a 14 day waiting period to slaughter, or (2) Retreat 30 days after initial treatment with a 21 day waiting period before slaughter. Do not retreat cattle within 30 days of initial treatment.
Chlorpyrifos (Dursban 44)	14	43.2 Pour-on	2 cc/100 lbs up to 16 cc max.	Do not treat bulls over 8 months of age of any breed.
Coumaphos (Co-Ral)	0	Spray or Dip 11.67% EC, 2 1/2 ozs/4 gals water 25 WP, 2 lbs/100 gal water	Wetting spray or immerse animal.	To backs every 3 weeks as needed. Repeat as necessary. Dip with WP only. Agitate dip suspension before each use. 1,2,3

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Insect and Insecticide	Min. Days from Last Application to Slaughter	Formulation & Strength	Amount of Formulation Per Animal or Area	Where and When to Apply Precautions (by nos. below) See Safety Restrictions
HORN FLY (cont'd) (Horn fly and grub controls aid face fly control)				
	0	1% Dust	Not more than 2 ozs/animal	Dust evenly into hair, over head, neck, shoulders, back and tailheads. Do not apply to sick, stressed or convalescent animal. Repeat as needed.
	0	1% Dust Ready to use		Apply 4-10 lbs in suspended, self-treatment dust bags. Suspend where animals will treat themselves daily, such as near minerals or salt blocks. Bottom of bag should hang 4-6 inches below topline of cattle. Protect duster from weather. Do not apply to sick, stressed or convalescent animals. Repeat as needed.
	0	11.6% EC Backrubber Oil 1 1/4 cups/1 gal #2 diesel fuel or #2 furnace oil	1 gal/20 ft cable	Keep backrubber charged. For best results, use forced application. Place so cattle will use daily.
	0	42% FL 1 qt / 100gals		
	0	5.8% EC 5 oz / 4 gals water		
Cyence	0		4 ml. to animal weighing less than 400 lbs., 8 ml. to animals weighing 400-8000 lbs 12 mls. to animals weighing over 800 lbs.	Apply pour-on along the top of the back and top of the head. Do not retreat within three weeks following treatment. Double the dose for biting and sucking lice.
Delice		1% pour-on	0.5% fl oz/100 lbs body weight up to max. 5 fl ozs for any one animal	Pour correct dose along back and down face.
Diflubenuron Dimilin Bolus (Vigilante)	0	9.7	1/2 - 2 boluses according to wt 300-550 lbs=1/2 bolus 551-825 lbs=1 bolus 826-1100 lbs=1 1/2 boluses 1101 lbs and heavier=2 boluses	Controls fly larvae in manure. All cattle in herd should be treated. Use a standard balling gun. Do not administer to cattle weighing less than 300 lbs. Do not administer more than 2 boluses to any animal regardless of weight.
Eprinomectin (Ivomec)	0	5 mg eprinomectin/ml	1 ml. / 22 lbs. body wt.	Administer pour-on to cattle 8 weeks of age or older. Apply pour-on to the top of animal along the backline from the withers to the tailhead.
Ivermectin (Ivomec)	48	5 mg ivermectin/ml Ready to use	1 ml/22 lbs body weight	Apply along the topline in a narrow strip extending from the withers to the tailhead.
Lambdacyhalothrin (Saber 1%) Pour-On	0	Ready-to-use	10 ml (1/3 fl. oz.) / animal less than 600 lbs. 15 ml. (1/2 fl. oz.) / animal more than 600 lbs.	Apply to beef cattle and calves for lice and horn flies. Apply pour-on down the backline. Repeat as needed but not more often than every two weeks and not more than four applications within a six month period.
HORN FLY (cont'd) (Horn fly and grub controls aid face fly control)				
Malathion	0	57% EC or 1 1/2 cups/10 gal water	2 qts	Apply every 3 weeks, if needed. Do not treat calves less than 1 month old.

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	0	25% WP, 1 1/2 lbs/25 gal water	2 qts	
	0	4% to 5% dust	2 oz/animal	Repeat in 2-3 weeks, if needed. Do not treat calves less than 1 month old.
Malathion Backrubber Oil	0	57% EC, 2/3 cup/1 gal #2 diesel fuel (2% Soln.)	1 gal/20 ft cable	Keep backrubber charged.
Methoprene (Altosid)	0	0.02 % Ready to use	Animal consume 1/4 - 1/2 lb/100 lbs body wt each month	Feed this oral insect growth regulator as free choice mineral or mixed supplements for pasture cattle early in the spring before horn flies appear.
		3.54 ozs Sustained Release Bolus		Administer the bolus to cattle orally using a balling gun. Administer 1/2 bolus to cattle weighing 300 lbs to 659 lbs and 1 bolus to cattle weighing 660 lbs to 1,400 lbs. Do not administer to cattle too small to swallow boluses. Allow sufficient time for the swallowing reflex to occur. Observe animals following dosing to insure that animals regurgitating bolus are retreated.
Methoprene bolus (Inhibitor)			1/2 to 1 according to wt	
Methoxychlor	0	24%, 2 lbs/25 gals water	2 qts (lg animals)	To backs every 3 weeks or as needed.
		50% WP, 2 lbs/25 gals water		
	0	10% Dust	20 ozs/animal	Repeat in 2-3 weeks, if needed. Repeat in 2 to 3 weeks, if needed.
	0	24% EC, 1 qt in 1 gal #2 diesel fuel	1 gal/20 ft cable	Saturate backrubbers. Keep charged.
Permethrin	0	5.7% EC, 1 qt/100 gal water 10% or 11%EC, 1pt/100 gal water 40% EC, 30 to 118 ml. / 25 gals water 1% pour-on as undiluted spray 42.5%EC, 1 cup / 100 gals water or 1 pt / 100 gals water		Spray animal thoroughly. Repeat as needed, but not more often than once every 14 days. To control lice or mites, a second treatment may be needed 14-21 days later. Apply 1 qt. of low concentration spray mixture per animal to control horn flies only. Apply 2 qts of high concentration spray per animal to control all labeled parasites. Repeat treatment as needed but not more than every 14 days.
	0	0.25% Dust Ready to use		Use in dust bags or apply WP to 2 ozs directly to animals. Retreat 14-21 days later, if needed for lice control.
Permethrin Rubbing Mixture	0	5.7% EC, 1 qt/10 gal diesel fuel 10% or 11% EC, 1 pt/1 gal #2 diesel 40% EC, 118 ml / 10 gal diesel		Keep backrubber device charged. Daily forced use provides best in results.

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HORN FLY (cont'd) (Horn fly and grub controls aid face fly control)				
Phosmet (Prolate, Lintox, Del-Phos)	3	11.6% EC, 1 gal in 200 gals water	Up to 1 gal/animal	Apply coarse spray to thoroughly wet the animal. Do not retreat within 7 days.
	0	1% Dust		Self-Treating Dust Bags. Apply in forced use or free choice use dust bags. Best results are obtained where cattle use these devices daily. Hand-Dusting: Apply 1 oz of dust per animal for flies and 1/2 oz for lice. Use less on smaller and younger animals. Apply to upper portions of back, neck and poll and rub in lightly. Repeat as necessary.
Pyrethrins +Synergist		Ready -to- use		As mist spray daily with hand or automatic sprayer
Rabon	0	3% D Ready to use	2 ozs/animal	Use in dust bag face/backrubbers.
	0	50 WP, 1 lb in 18 gals water		Apply as a coarse spray. Apply 2 qts to 1 gal per animal to obtain complete wetting.
Rabon Oral Larvacide (Pre-mix or Ready to use)	0	7.76 G	70 mg/100 lbs. body wt. daily.	Follow label directions. In complete or concentrate feed and block or mineral mix. Feed free choice. Begin feeding before flies appear in spring. Feed continuously until frost. Must be supplemented to provide effective control. Use in conjunction with other controls. Constant consumption is important to monitor.
Stirofos + Dichlorvos (Ravap 28.7% EC)	0	5 ozs/gal #2 diesel (1% stirofos + 0.25% dichlorvos)	1 gal/20 ft cable	Pour 1 gal. of mixture per 20 ft. of cable. Keep rubbing device charged.
	0	28.7% EC, 1 pt/6 gals water or 1 pt/10 gals	1/2 - 1 gal/animal	Apply as coarse spray. Apply 1/2 gal. spray per animal. Do not repeat application within 10 days.
Tiguvon (Lysoff)	21/35	7.6% EC 1/2 gal/3 1/2 gal water (1% pour-on)	1 fl oz/100 lbs animal	Do not slaughter treated cattle within 21 days following a single application. If a second or third application is made, do not slaughter within 35 days if the last treatment of mature cattle. Second and third treatment may be made 14 days apart. Do not apply to sick, convalescent, or stressed livestock or to animals less than 3 months old. Do not spray animals for 10 days before or after shipping or weaning, or after exposure to contagious and infectious diseases. Do not apply in conjunction with oral drenches or other internal medications nor with natural pyrethrins or synthetic pyrethroids or their synergists or with other cholinesterase inhibitors.
Vapona	1	21.8% EC, 1 qt/6 gal water	1-2 fl ozs	As mist spray daily with hand or automatic sprayer. 7 Spray to cover all parts of the body. Do not wet the skin. Do not apply more than 2 fl ozs/animal each day.

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EAR TAGS				
cyfluthrin (Cutter Gold)		10%	1 tag on each ear	Attach when flies build up. Remove tags at end of fly season.
Diazinon (Optimizer) (Optimizer - Calf) (Bova Gard 4) (Terminator) (Patriot) (Cutter 1)		21.4% 21.4% 21.4% 20.0% 40.0% 40.0%		
Diazinon + chlorpyrifos (Warrior)		30.0% 10.0%		
Fenthion (Cutter Blue)		20%		
Fenvalerate (Ectrin)		8%		
Lambdacyhalothrin (Saber, Sater Extra, Excalibur 4)		10%		
permethrin (Gard Star, Atroban, Deckem, Expar, Gard Star Plus)		10%		
pirimiphos-methyl (Dominator) (Rotator 4)		20%		
Zetacypermethrin (Python) (Zetagard 4)		10%		
Ethion (Commando)		36%		
LICE				
Use same materials and formulations as for horn flies. Follow same time limits between applications and slaughter.				Spray thoroughly. Repeat in 2-3 weeks, if needed. Backrubber used for flies and lice control.
Amitraz (Taktic)	0	See label 12.5% EC 1 qt/100 gals	Spray completely	Apply up to 2 gals of spray for a fully grown animal. Penetrate spray to skin until run-off. Spray legs, udder, tail regions, head, ears, shoulder area and neck. A second application may be needed 10-14 days later. No waiting period between application and slaughter. Use within 6 hrs of mixing.

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LICE (Cont'd)				
Chlorpyrifos (Dursban 44)	14	43.2 PO	2 cc/100 lbs up to 800 lbs. Max. 16 cc / animal	Apply spot-on to one spot at the top midline area of the animal just behind the shoulder blades and neck junction. Use specially adapted applicator to allow exact treatment. Wear rubber gloves and apply in a well ventilated area. Apply Do not treat bulls over 8 months of age of any breed. Do not treat any dairybreed cattle. So not treat purebred continental or exotic breed cattle such as Simmental, Chianina, Charlais or Gelbvieh. Do not treat veal calves. Do not treat beef-breed calves under 12 weeks of age. Do not treat sick, convalescent or severely stressed animals. Do not treat cattle for 10 days before or after shipping, dehorning, castration, vaccination, etc. If re-treatment is needed, follow this schedule: (1) Re-treat 45 days after initial treatment with a 14 day waiting period to slaughter, or (2) re-treat 30 days after initial treatment with a 21 day waiting period before slaughter. Do not retreat cattle within 30 days of initial treatment.
Cyfluthrin (Cylence)	0	1% PO	8 ml. for animals less than 400 lbs. 16 ml. for animals between 400-800 lbs. 24 ml. for animals over 800 lbs.	Apply pour-on along the top of the back and top of the head. For optimal lice control, an initial application followed by a second treatment 3 weeks later is recommended.
Coumaphos (Co-Ral)	0	Spray 11.6% EC 2 ½ oz/4 gals water		Apply a wetting spray or immerse animal. Repeat as necessary. Do not apply to sick, convalescent or stressed livestock or to animals less than 3 months old. Do not spray animals for 10 days before or after shipping or weaning, or after exposure to contagious and infectious diseases. Do not spray in a confined, non-ventilated area. Do not apply in conjunction with oral drenches or other internal medications nor with natural pyrethrins or synthetic pyrethroids or their synergists or with other cholinesterase inhibitors.
		Spray 42% FL 1 qt/100 gals water		
		Dip/Spray 25% WP: 2 lbs./100 gals water		
		Spray 5.8% EC 5 ozs. / 4 gals. water		
	0	1% D	Not more than 2 ozs/animal	Dust evenly into hair over the head, neck, shoulders, back and tailhead. Do not apply to sick, stressed or convalescent animals. Repeat as needed. See restrictions under 11.6%EC
	0	1% D	Dust bag Ready to use	Apply 4-10 lbs in suspended, self-treatment dust bags. Suspend where animals will treat themselves daily, such as near minerals or salt blocks. Bottom of bag should hang 4-6 inches below top line of cattle. Protect duster from weather. Do not apply to sick, stressed or convalescent animals. Repeat as needed. See restrictions under 11.6% EC
dioxathion (Del-Tox)	14 freshening	8 ozs/12 gals		
(Delnav)		6 ozs/1 gal oil	Self-application device	
LICE (Cont'd)				

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Dursban (CPF-44)	14		By weight	Do not use on bulls over 800 lbs - exotic breeds or dairy cattle. Apply spot-on to one spot at the top midline area of the animal just behind the shoulder blades and neck junction. Use specially adapted applicator to allow exact treatment. Wear rubber gloves and apply in a well ventilated area. Never use over 16cc/animal. Do not treat any bulls over 8 months of age. Do not treat any dairybreed cattle. Do not treat purebred continental or exotic breed cattle such as Simmental, Chianina, Charlais or Gelbvieh. Do not treat cows 21 days prior to calving or for 14 days after calving. Do not treat veal calves. Do not treat beef-breed calves under 12 weeks of age. Do not treat sick, convalescent or severely stressed animals. Do not treat cattle for 10 days before or after shipping, dehorning, castration, vaccination, etc. Do not slaughter animals within 14 days of initial treatment. If retreatment is needed, follow this schedule: (1) Retreat 45 days after initial treatment with a 14 day waiting period to slaughter, or (2) Retreat 30 days after initial treatment with a 21 day waiting period before slaughter. Do not retreat cattle within 30 days of initial treatment.
Famphur (Warbex)	35 21 freshening	13.2% Pour-on	1 oz/200 lbs up to 4 ozs max. 200 lb – 1 oz. 400 lb – 2 oz. 600 lb – 3 oz. 800 lb & over – 4 oz.	Pour along backline. Do not apply more than 4 fl ozs per animal. Do not treat calves 3 months old; animals stressed from castration, over-excitement or dehorning; sick or convalescent animals. Initial treatment of lice must be made at the times recommended for grub control. If lice reinfestation occurs, animals may be retreated 40 days after last treatment. Do not treat cattle not previously treated for grubs during Nov., Dec., Jan., and Feb. Do not treat Brahman bulls. Famphur is a cholinesterase inhibitor. Don't use any drug, pesticide or other chemicals having cholinesterase inhibiting activity either simultaneously or within a few days before or after treatment.
Fenthion (Spotton)	45	20% Spot-on	150-300 lbs = 4cc 301-600 lbs = 8cc 601-900 lbs = 12cc 901-1,200 lbs = 16cc 1,201 lbs & over = 20cc	Apply with syringe or other applicator adapted for this.
Fenthion (Tiguvon)	35	3% Pour-on	1/2 fl oz/100 lbs body wt	Pour along backline. Do not retreat within 35 days. Retreat for lice after 35 days, if needed. See restrictions for coumaphos.
Fenthion (Lysoff)	21 dys – 1 application 35 dys. -- 2-3 applications	7.6% EC (1% Pour-on) 1/2 gal / 3 1/2 gals water	1 fl oz/100 lbs body wt	A single treatment can be followed by a second or third treatment 14 days apart. See restrictions for coumaphos.
fenvalerate (Ectrin)		10 WDL 2 ozs/5 pts	2-3 ozs	Spray on head, neck, legs and backline. Do not treat more frequently than every 4 days.
		10 WDL 4 ozs/6 gals	1-2 pts	Spray as above. Do not treat more frequently than weekly.
		4 ozs/6 gals	2 qts	Do not retreat more often than every 2 weeks.

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LICE (Cont'd)				
Ivermectin (Ivomec)	35	1% Injection Ready-to-use	1 cc/110 lbs	Administer subcutaneously only 1 ml (10 mg ivermectin) per 110 lbs body weight. Restrain animals and inject under the loose skin in front of or behind the shoulder. A sterile, 16-gauge, 1/2 to 3/4" needle is suggested. Divide doses greater than 10 ml between two injection sites to reduce occasional transitory discomfort or site reaction.
	48	Pour-on	1 ml/22 lbs body wt	Apply along the topline in a narrow strip extending from the withers to the tailhead.
	180	Bolus 1.72 gms. / bolus Ready-to-use	1 bolus – cattle weighing at least 275 lbs. & not more than 660 lbs.	Use a balling gun to administer. Calves must be ruminating and greater than 12 weeks of age.
Eprinomectin (Ivomec Eprinix)	0	5 mg. eprinomectin/ml. Pour-on	1 ml/22 lbs. body weight	Administer pour-on to cattle 8 weeks of age or older. Apply pour-on to the top of the animal along the backline from the withers to the tailhead.
Note: Self-application devices under horn fly aid in louse control.				
Lambdacyhalothrin (Saber)	0	1% pour-on	10 ml. (1/3 fl. oz.) / head – animals wt. less 600 lbs. 15 ml. (1/2 fl. oz.) / head – animals wt. more 600 lbs.	Apply down the backline. Do not apply to face. Repeat treatments as needed but do not apply more than once every two weeks. Do not apply more often than four times within any six-month period. For sucking lice, two treatments and a 14-day interval are recommended.
Malathion	0	57% EC, 1 1/2 cups /10 gals water	About 2 qts / mature animal	Apply every 3 weeks, if needed. Do not treat calves less than 1 month old.
		4% to 5% Dust Ready to use	2 ozs (2 Tbs)/animal	Repeat in 2-3 weeks, if needed. Do not treat calves less than 1 month old.
		25% WP, 1 1/2 lbs (about 5 cups) / 10 gals water	About 2 qts./ mature animal.	Spray animals thoroughly. Apply every 3 weeks, if needed. Do not treat calves less than 1 month old.
Methoxychlor	30	50WP, 2 lbs/25 gals	Wet animal to skin about 2 qts/mature animal	Repeat every 2-3 weeks, if needed.
	0	24EC, 2 qts/25 gals		
		10% Dust	2 ozs (2 Tbs)/animal	Repeat in 2-3 weeks, if needed.
		24% EC Backrubber 1 qt/gal #2 diesel fuel	1 gal/20 ft cable	Keep backrubber charged.
permethrin	14 days to freshening	0.25% Dust	2 ozs/animal	Retreat 14-21 days later, if needed; but, not more often than every 14 days.
	0	5.7% EC, 1 qt/100 gals. water	Spray animal thoroughly	Retreat as needed but not more often than once every 14 days.
LICE (Cont'd)				

Beef

Insect and Insecticide	Min. Days from Last Application to Slaughter	Formulation & Strength	Amount of Formulation Per Animal or Area	Where and When to Apply Precautions (by nos. below) See Safety Restrictions
permethrin (cont'd)	0	10.0% or 11% EC, 1 pt/100 gals. water	Same as above.	Same as above.
	0	11% EC 1 pt. / 25 gals. water	1 to 2 qts of coarse spray per animal over whole body surface.	For mange, scabies, ticks and lice, thoroughly wet the animal. Repeat the application in 10 to 14 days for mites.
	0	40% EC 30 - 118 ml. / 25 gals. water	Same as above.	Same as above.
	0	42.5% EC	1 cup / 100 gals. water or 1 pt. / 100 gals water	Apply 2 qts. of high concentration spray per animal to control all labeled parasites, except horn flies. Repeat treatment as needed but not more than every 14 days.
Permethrin (Delice, Atroban)	0	1% Pour-on	0.5% fl oz (15cc)/100 lbs body wt (max. 5 fl ozs/animal)	Pour correct dose along back and down face. Repeat treatment as needed, but not more than once every two weeks. For optimum lice control, two treatments at 14 day intervals is recommended.
	0	0.25% D Ready to use	2 ozs (5 Tbs)	Apply 4 to 10 lbs in self-treatment cotton cloth, doubled burlap bags or commercial dust bags. Suspend where animals will treat themselves daily, such as near mineral stations, salt blocks or in milking barn exit. Bags should hang 4 to 6 inches below topline of cattle. Protect bags from weather. Do not hang bags over feed, mineral or water troughs.
phosmet (Del-Phos, GX-118, Lintox, Prolate)	3	11.6% EC 0.125% EC Spray - 1 gal./ 100 gal water	Apply up to 1 ga. / animal.	Spray animal thoroughly with high pressure and course droplets. Do not re-treat within 7 days. See restrictions for coumaphos.
phosmet	0	1% Dust Ready-to-use	Self-treating	Apply in forced use or free choice use dust bags. Best results when devices are used daily. Hand-Dusting: Apply 1 oz. of dust per animal for flies and ½ oz. for lice. Use less on smaller and younger animals. Apply to upper portions of back, neck and poll and rub in lightly. Repeat as necessary.
Pyrethrin 0.025% = Synergist 0.25%		EC Mix according to label directions.	1 to 2 qts.	Apply a wet spray every 2 to 3 days
			1 to 2 fl. ozs.	Apply as a light mist spray daily with hand or automatic sprayer.
Stirofos (Rabon)	0	50WP: 1 lb. / 18 gals water	2 qts. to 1 gal. / animal.	Apply as a course spray. Apply to obtain complete wetting.
		24EC: 10 ozs/5 gals		
		6 ozs/1 gal oil	Self-application device	
		3% D	2 ozs/animal	Apply by hand or duster to thoroughly penetrate hair coat.
			Dust bag	Apply in dust bags which are hung and protected from rain in dusting stations where cattle are forced to use them. Some control will be obtained by free choice use.
Stirofos 1% + Dichlorvos 0.25% (Ravap 28.7% EC)	0	28.7% EC, 5 oz. / 10 gals. water	½ to 1 gal. / animal.	Apply as a coarse spray. Do not treat more often than every 10 days.

LICE (Cont'd)

Beef

Insect and Insecticide	Min. Days from Last Application to Slaughter	Formulation & Strength	Amount of Formulation Per Animal or Area	Where and When to Apply Precautions (by nos. below) See Safety Restrictions
Trichlorfon (Neguvon)	21 7 freshening	8% PO	1 oz/100 lbs	Apply 1/2 fl oz per 100 lbs animal body weight. Pour on evenly along animal's backline. For best grub control results, treat during early summer and no later than 6 weeks before the expected appearance of the grubs in the animal's back. Do not apply in conjunction with oral drenches, other internal medications or other organophosphate insecticides. Do not treat animals less than 3 months of age. Do not treat sick convalescent or stressed livestock. Do not treat animals for 10 days before or after shipping or weaning or after exposure to contagious or infectious diseases.

EAR TAGS

Diazinon (Optimizer)	21.4%
(Bova-Gard)	21.4%
(Optimizer - Calf)	21.4%
(Patriot)	40.0%
(Cutter - 1)	40%
Diazinon + chlorpyrifos (Warrior)	30% 10%
Permethrin (Permethrin, Atroban, Deckem, Expar ⁴ , Gard Star Plus)	10%
Ethion (Commando)	36%
Fenvalerate (Ectrin)	8%
Lambdacyhalothrin (Saber)	10%
(Excalibur)	10%
zetacypermethrin (Python)	10%
(Zetagard)	10%

SCREWWORM

Coumaphos (Co-Ral)	0	11.6% EC 10 ozs/4 gals water	Spray as needed for wound infesting larvae. Wet entire body to skin with high pressure spray (200-400 psi). Treat during early summer for grub control and no later than 6 weeks prior to expected appearance of grubs in the back. Do not apply to sick, convalescent or stressed livestock or to animals less than 3 months old, (except in Federal or State eradication programs or until they are in good condition.) Do not spray animals for 10 days before or after shipping or weaning, or after exposure to contagious and infectious diseases. Do not spray in a confined, non-ventilated area. Do not apply in conjunction with oral drenches or other internal medications nor with natural pyrethrins or synthetic pyrethroids or their synergists or with other cholinesterase inhibitors.
		5% D Ready to use	Dust or spray lightly wounds and surrounding area. Repeat as necessary. For ear ticks, dust into ear and also treat the adjacent head area. 3
		Spray foam wound treatment	
	14	3% livestock bomb	

Beef

Insect and Insecticide	Min. Days from Last Application to Slaughter	Formulation & Strength	Amount of Formulation Per Animal or Area	Where and When to Apply Precautions (by nos. below) See Safety Restrictions
Lindane	0	3% (EQ 335)	Minimum needed, not more than 3 tsp.	Brush or smear on wound and surrounding area, twice first week and then weekly until healed.
STABLE FLY				
Dichlorvos (Vapona)	1	21.8EC 1 qt/6 gals	1-2 fl ozs as a mist spray daily.	Spray all parts of animal. Do not wet skin. Do not apply more than 2 fl ozs per animal each day.
Permethrin	0	5.7% EC 1 qt/100 gals 10% or 11%EC 1 pt/100 gals 40% EC 30 - 118 ml./ 25 gal. water 11% EC 1 pt. / 25 gals water 11% EC 1 qt. / 5 gals. 42% EC 1 cup / 100 gals water	Spray animal thoroughly 1 to 2 qts. of coarse spray / animal over whole body surface. 1 to 2 ozs. spray / animal 2 qts. of high concentration spray / animal.	Retreat as needed but not more often than once every 14 days. To control lice or mites, a second treatment may be needed 10-21 days later. Spot treat the back, face, legs and ears. Repeat treatment as needed but not more than every 14 days.
Permethrin (Delice)		1% pour-on	0.5% fl oz (15cc)/100 lbs body wt max. 5 fl ozs./animal	Pour correct dose along back.
Permethrin	0	Rubbing Mixture: 5.7% EC - 1 qt./10 gals diesel 10% or 11% EC - 1 pt / 1 gal #2 diesel 40% EC - 118 ml /10 gal. diesel		Keep rubbing device charged. Daily forced use provides best results.
Pyrethrins	0	Ready to use	1-2 fl ozs daily	May give protection for short periods. Wet hair, not skin.
Stiufos (Rabon)	0	7.76% granular oral larvicide. Premix or ready-to-use.	70 mg. / 100 lbs body weight daily.	Feed ready-to-use block or mineral free choice so animal will consume amount daily. Begin feeding before flies appear in spring. Feed continuously until frost. Must be supplemented to provide effective control.
EAR TAGS				
Diazinon (Bova Gard)		20% Ear tag		
(Patriot)		40% Ear tag		
(Terminator)		20% Ear tag		
(Optimizer)		20% Ear tag		
(Optimizer - Calf)		20% Ear tag		
(Cutter 1)		40% Eartag		
Diazinon + chlorpyrifos (Warrior)	0	30%		
		10%		
Ethion (Commando)	0	36%		
Fenvalerate (Ectrin)		10% Ear tag		

Beef

Insect and Insecticide	Min. Days from Last Application to Slaughter	Formulation & Strength	Amount of Formulation Per Animal or Area	Where and When to Apply Precautions (by nos. below) See Safety Restrictions
Lambdacyhalothrin + piperonyl butoxide (Saber) (Excalibur)		10% Ear tag 13%		
Zetacypermethrin + Piperonyl butoxide (Python, Zetagard)	0	10% 20%		
Permethrin (Atroban, Deckem, Expar, Gold Star Plus)		10% Ear tag		
Zetacypermethrin (Python) (Zetagard ⁴)		10% Ear tag		
TICKS				
Amitraz (Taktic)	0	12/5% EC 1 qt/100 gals	Up to 2 gals to fully grown animal	Penetrate spray to skin until run-off. Pay particular attention to legs, udder, tail regions, head, ears, shoulder area and neck.
Coumaphos (Co-Ral)	0	11.6% EC 5 ozs/4 gals	Spray; Wetting spray	Repeat at necessary. Make dips with WP formulations only. See other restriction for coumaphos.
		25% WP 4 lbs/100 gals	Spray or Dip	See restrictions for coumaphos.
		5% Dust		For ear ticks, dust into the ear and also treat the adjacent head area. Repeat when necessary.
		5.8% EC 5 ozs / 4 gals water	Spray.	See restrictions for coumaphos.
		25 % WP - 4 lbs / 100 gals water	Spray/Dip	Apply a wetting spray or immerse animal. Keep dip vat charged and agitated. See restrictions for coumaphos. Make dips with WP formulations only.
		11.6% EC - 10 oz. / 4 gals water	Spray	
		42 % FL 1 gal/ 100 gals water	Spray	
5.8% EC 20 ozs / 4 gals water	Spray			
Ivermectin (Ivomec)	180	SR Bolus 1.72 gms. ivermectin / bolus	1 bolus - to cattle weighing at least 275 lbs. & not more than 660 lbs.	Use a balling gun. Calves must be ruminating and greater than 12 weeks of age.

Beef

Insect and Insecticide	Min. Days from Last Application to Slaughter	Formulation & Strength	Amount of Formulation Per Animal or Area	Where and When to Apply Precautions (by nos. below) See Safety Restrictions
TICKS (Cont'd)				
Malathion	0	57% EC 1 1/2 cups/10 gals	Spray animal thoroughly (about 2 qts/animal)	Apply every 3 weeks, if needed. Do not treat calves less than 1 month old.
	0	25% WP 1 1/2 lbs (5 cups)/10 gals		Spray animals thoroughly (about 2 qts. per mature animal). Apply every 3 weeks, if needed. Do not treat calves less than 1 month old.
	0	4% - 5% Dust	About 2 ozs (2 Tbs)/animal	Repeat in 2 to 3 weeks, if needed. Do not treat calves less than 1 month old.
Permethrin	0	5.7% EC 1 qt/100 gals 10% or 11%EC 1 pt/100 gals	Spray animal thoroughly	Retreat as needed, but not more often than once every 14 days.
		40% EC 30-118 ml / 24 gal water		For mange, scabies, ticks and lice, thoroughly wet the animal.
		11% EC 1 pt. / 25 gals. water	1 to 2 qts. as course spray / animal.	Spot treat the back, face, legs and ears.
		11% EC 1 qt. / 5 gals. water 42 % EC 1 cup / 100 gals. water. 1 pt. / 100 gals. water	1 to 2 ozs. / animal. 2 qts. high conc. spray / animal.	Repeat treatment as needed but not more than every 14 days.
Phosmet (Prolate, Lintox)	3	11.6% EC 1 gal/150 gals	Up to 1 gal/animal	Apply as a coarse high pressure spray to thoroughly wet the skin and hair of the animal. Do not retreat within 7 days. See restriction for coumaphos.
Stirofos (Rabon)	0	50% WP 1 lb/12 gals	1/2 to 1 gal/animal	Apply coarse spray. Apply 1/2 to 1 gal. per animal as needed to obtain complete wetting.
Stirofos + Dichlorvos (Ravap)	0	0.35% 0.1% 28.7% EC 1 pt/6 gals	1/2 to 1 gal/animal	Apply a coarse spray. Do not repeat application within 10 days.
EAR TAGS				
Cyfluthrin (Cutter Gold)	0	10%		
Diazinon (Optimizer) (Bova Gard ⁴) (Optimizer - Calf) (Patriot) (Cutter 1)	0	20% Ear tag		
		21.4%		
		21.4%		
		40%		
		40%		
Diazinon + chlorpyrifos (Warrior)	0	30% 10%		
Ethion (Commando)	0	36%		

Beef

Insect and Insecticide	Min. Days from Last Application to Slaughter	Formulation & Strength	Amount of Formulation Per Animal or Area	Where and When to Apply Precautions (by nos. below) See Safety Restrictions
Lambdacyhalothrin (Saber) (Excalibur)	0	10% Ear tag		
Permethrin (Atroban, Deckem, Exlpar ⁴ , Gard Star Plus)	0	10%		
Zetacypermethrin + piperonyl butoxide (Python)	0	10% 20%		
HORSE FLY, DEER FLY, MOSQUITO, BLACK FLY				
Permethrin	0	Spray: 5/7% EC -- 1 qt/100 gals 10% or 11% EC -- 1 pt/100 gals 40% EC -- 30 to 118 ml / 25 gals water 11% EC -- 1 pt/ 25 gal water 42 % EC – 1 cup / 100 gals water or 1 pt / 100 gals water	Spray animal thoroughly 1 to 2 qts coarse spray / animal. 2 qts. of high conc. spray / animal	Retreat as needed, but not more often than once every 14 days. Apply over whole body surface. Repeat treatment as needed but not more than every 14 days.
Permethrin (Synergized Delice)		1% pour-on	0.5% fl oz (15cc)/100 body wt (max. 5 fl ozs/animal)	Pour correct dose along back and down face.
Pyrethrins		Ready to use	1-2 fl ozs daily	Apply to wet hair, not skin.
Vapona	1	21.8% EC 1 qt/6 gals	1-2 fl ozs. daily	Do not wet skin. Spray to cover all parts of animal. Do not spray more than 2 fl ozs per animal per day.
Ear Tags				
Zetacypermethrin + piperonyl butoxide (Python, Zetagard)		10% 20%		

Beef

Insect and Insecticide	Min. Days from Last Application to Slaughter	Formulation & Strength	Amount of Formulation Per Animal or Area	Where and When to Apply Precautions (by nos. below) See Safety Restrictions
HOUSE FLIES				
Dichlorvos (Vapona)	1	21.8 % EC 1 qt / 6 gals water	1 to 2 fl. ozs as a light mist spray daily.	Spray to cover all parts of the animal. Do not wet the skin. Do not apply more than 2 fl. ozs. / animal each day.
Permethrin	0	5.7 % EC – 1 qt /100 gals water 10 % or 11 % EC – 1 pt/100 gals water 40% EC – 30 to 118 ml / 25 gals water 11% EC – 1 pt/ 25 gals water 42.5% EC – 1 cup /100 gals water	Spray animal thoroughly 1 to 2 qts coarse spray / animal over whole body. 2 qts of high conc. spray / animal	Retreat as needed but not more often than once every 14 days. Repeat treatment as needed but not more than every 14 days.
Permethrin (Delice, Atroban)	0	1.0% Pour-on	0.5% fl. oz. (15cc) / 100 lbs. body weight of animal.	Maximum of 5 fl. oz. for any one animal. Pour correct dose along back and down face.
Pyrethrin	0		1 to 2 fl ozs daily or as needed	Apply to wet hair not skin.
Strofos (Rabon)	0	7.76% granular oral larvicide. Pre-mix or ready-to-use blocks & mineral feeds.	70 mg. / 100 lbs. body weight daily.	Mix 7.76% oral larvicide with concentrate feed as directed on label. Begin feeding before flies appear in spring. Feed continuously until frost. Must be supplemented to provide effective control.
HOUSE FLIES (Cont'd)				
			Ear Tags	
Diazinon (Patriot) (Cutter 1)		40%		
Diazinon + chlorpyrifos (Warrior)		30 % 10%		
Ethion (Commando)		36%		
Fenvalerate (Ectrin)		10%		
Permethrin (Atroban, Deckem, Expar ⁴ , Gard Star plus)		10%		
HOUSE FLIES (Cont'd)				
			Ear Tags	
Zetacypermethrin + piperonyl butoxide (Python, Zetagard ⁴)		10% 20%		
Lambdacyhalothrin + piperonyl butoxide (Saber, Excalibur)		10% 20%		

Beef

Insect and Insecticide	Min. Days from Last Application to Slaughter	Formulation & Strength	Amount of Formulation Per Animal or Area	Where and When to Apply Precautions (by nos. below) See Safety Restrictions
MITES, SCABIES (Psoroptic, Chorioptic, Scarcoptic)				
Amitraz (Taktic)	0	12.5% EC 1 qt / 50 gals water		Apply in a spray dip machine as instructed by USDA, APHIS in mange mite (scabies) control. A second application is required 7 to 10 days later.
Coumaphos (Co-Ral)	0	25% WP 10 lbs/100 gals water	Dip treatment	Agitate dip suspension thoroughly before use. Two treatments 10 to 14 days apart are necessary to control scabies. Assure thorough treatment of animals. See restriction for coumaphos.
Ivermectin (Ivomec)	35	1% Clear, ready-to-use	1 ml. (10 mg. ivermectin) per 110 lb. body weight.	Restrain animals and inject under the loose skin in front of or behind the shoulder. A sterile, 16-gauge, ½ to ¾" needle is suggested. Divide doses greater than 10 ml. between two injection sites to reduce occasional transitory discomfort or site reaction. Apply along the topline in a narrow strip extending from the withers to the tailhead. Calves must be ruminating and greater than 12 weeks of age.
	48	Pour-on, ready-to-use 5 mg. ivermectin/ml.	1 ml. / 22 lbs of body weight	
	180	SR Bolus 1.72 gms. ivermectin/bolus	1 bolus to cattle weighing at least 275 lbs. & not more than 660 lbs.	
Eprinomectrin (Ivomec Eprinix)	0	Pour-on 5 mg. eprinomectrin/ml.	1 ml. / 22 lbs. body wt.	Apply pour-on to the top of the animal along the backline from the withers to the tailhead.
Permethrin	0	5.7 EC – 1 qt /100 gals water	Spray animal thoroughly	Retreat as needed but not more often than once every 14 days. To control lice or mites, a second treatment may be needed 10-21 days later.
		10% or 11% EC – 1 pt/100 gals water		
		40% EC – 30 to 118 ml / 25 gals water		
		1% pour-on 11% EC – 1 pt/25 gals water	1 to 2 qts of coarse spray per animal over whole body.	For mange, scabies, ticks and lice, thoroughly wet the animal. Repeat the application in 10 to 14 days for mites.
		42.5% EC – 1 cup/100 gals water		Apply 2 qts. of high concentrate spray per animal to control all labeled parasites. Repeat treatment as needed but not more than every 14 days.
		1 pt/100 gals water		
Phosmet	3	11.6% EC 1 ga. / 150 gals water	1 gal. / animal	Apply as a coarse high pressure spray to thoroughly wet the skin and hair of the animal. Do not retreat within 7 days. See restrictions for coumaphos.

Safety Restrictions - Beef

1. Wet entire body to skin with high pressure spray (200-400 psi). Treat during early summer for grub control and no later than 6 weeks prior to expected appearance of grubs in the back. Do not apply to sick, convalescent or stressed livestock or to animals less than 3 months old, (except in Federal or State eradication programs or until they are in good condition.) Do not spray animals for 10 days before or after shipping or weaning, or after exposure to contagious and infectious diseases. Do not spray in a confined, non-ventilated area. Do not apply in conjunction with oral drenches or other internal medications nor with natural pyrethrins or synthetic pyrethroids or their synergists or with other cholinesterase inhibitors.
2. Coumaphos (Co-Ral) and trichlorfon (Neguvon) are systemic insecticides. If you need a grub control, do not spray or pour on any of the other materials. If you spray or pour on one of these insecticides, do not treat the same animal with any of the other materials.
3. Do not treat animals less than 3 months old with coumaphos (Co-Ral). Spray animals 3-6 months old lightly. Do not use with synergized pyrethrins, allethrin or synergist. Do not spray animals or apply pour-on for 10 days before or after shipping or weaning, or after exposure to disease. Do not apply in conjunction with oral drenches or other medications such as phenothiazine, or with other organic phosphates.
4. Apply a wetting spray or immerse animal. Repeat as necessary. Make dips with WP formulation only. See restrictions in #1 above. Agitate dip suspension thoroughly before each use to assure uniform treatment.
5. Dippers used with pour-ons for grub control should be stored in a safe place so no one will use it as a drinking dipper.
6. Do not apply more than 2 fl. ounces per day per animal when using mist sprays containing dichlorvos (DDVP). Do not wet the hide with the spray.
7. Do not apply coumaphos (Co-Ral) on backrubbers in conjunction with oral drenches or other internal medications, such as phenothiazine, or with other organic phosphates. Do not use with synergized pyrethrins, allethrin or synergist. Suspend backrubber at a height that will prevent straddling.

Be sure to observe all precautions on insecticide labels to prevent injury to animals and humans and to prevent illegal insecticide residues in beef and beef products.

Abbreviations Used in Chart

B	=	Bait
D	=	Dust
EC	=	Emulsion Concentrate
Oil	=	Mix with Diesel or Fuel Oil
PO	=	Pour On
Soln.	=	Solution
SP	=	Spot On
WP	=	Wettable Powder
WS	=	Water-Mixed Spray

Fly Control In Livestock Facilities (Dairy Barns, Swine Barns, Livestock Sheds, and Other Animal Buildings)

Insecticide ²	Spray Concentration and Mixing Instructions	Methods of Application and Safety Restrictions
RESIDUAL AND BAIT SPRAYS¹		
1. cyfluthrin (Tempo) 24.3% EC, 20% WP, SPY, HE	Mix 9.5 grams or 19 grams of 20% WP or mix 16 ml of 24.3% EC in sufficient water to cover 1000 ft ² .	Direct as a coarse, wetting spray to surfaces in livestock facilities where flies congregate, such as ceilings, walls, fences, posts, and manure. Apply to point of runoff (1 gal per 500-1000 sq ft). Do not contaminate feed, drinking water milk or milk handling equipment. Do not apply as a space spray. Do not apply directly to animals. Repeat as needed. For baited solutions, add 1 lb of sugar per gal of spray. Remove animals before spraying and return them when spray dries.
2. diazinon (Dryzon) 50% WP, OP, LE	Residual Spray: Mix 2 lbs or 4 lbs of 50% WP in 25 gals of water. To make a bait spray, mix 1 lb of sugar or 2 cups of syrup or molasses in the spray mixture.	Remove animals from buildings or corrals prior to treatment and keep animals out for at least 4 hours. Do not apply in dairy barns, milk rooms and poultry houses. Apply 1 gal of residual sprays as an overall spray at the rate of 1 gal per 350 to 750 square feet to ceilings and walls of livestock sheds, calf barns, hog barns, loafing sheds and other farm buildings. See restrictions for cyfluthrin in (#1) above.
3. dimethoate (Cygon, Residual Fly Spray) 2 lbs (23.4%) a.i. per gal. EC, OP, HE	1% spray. Mix 1 gal of 2 lbs per gal EC in 25 gals of water	See methods of application and safety restrictions for cyfluthrin (#1) above. Do not apply in milk rooms.
4. fenvalerate (Ectrin) 10% WDL, SPY, HE	Mix 1 qt of 10% WDL in 10 or 25 gals of water. (Longer residual results from higher concentration).	See methods of application and safety restrictions for cyfluthrin (#1) above. For spraying horse barns and swine buildings only. Repeat in 14-30 days, if needed. Spray ceilings, walls and walkways. Do not treat horse barns if horses are intended for slaughter.
5. malathion (Cythion) 5 lbs a.i. per gal premium grade 57% EC, OP, LE	Mix 1 qt EC in 12 gals of water	See methods of application and safety restrictions for cyfluthrin (#1) above. Remove lactating dairy animals and all animals under 1 month of age before treating.
6. methoxychlor 2 lbs a.i. per gal (25%) EC or 50% WP, CH, LE	2.5% to 5% spray. Mix 1 gal EC or 4 lbs WP in 10 gals of water.	See methods of application and safety restrictions for cyfluthrin (#1) above. Remove animals before spraying. When spray dries, animals can be returned. Do not apply in milk rooms, dairy barns or poultry houses.
7. permethrin (Atroban, Bear Car, Ectiban, Gardstar, Insectrin, Overtime, Permaban, Permethrin) 5.7% EC, 11% EC 40% EC, or 25% WP, SPY, HE	5.7% EC is ready to use as a mist spray OR mix 1 qt 5.7% EC in 12.5 gals of water OR mix 6.67 ozs 25% WP in 10 gals of water OR mix 1 pt 11% EC in 10 gals of water OR mix 90 to 118 ml. 40% EC in 10 gals. water.	Apply as a residual surface spray to fly resting areas. Do not spray manure or litter. Do not apply directly to livestock or poultry. Do not apply in milk or egg storage areas. Apply 5.7% EC undiluted at 4 ozs per 1000 sq ft of surface area or apply diluted WP and EC mixtures at 1 gal/750 sq ft. Do not apply more often than once every 2 weeks.
8. tetrachlorvinphos, stirofos (Rabon) 50% WP. OP, LE	1% or 2% spray. Mix 4 lbs or 8 lbs WP in 25 gals of water	See methods of application and safety restrictions for cyfluthrin (#1) above.
9. tetrachlorvinphos, stirofos, 2 lbs a.i. per gal (23%) + dichlorvos 0.5 lb a.i. per gal (5.7%) (Ravap) EC, OP, HE	1.25% to 2.5% spray. Mix 1 gal or 2 gals EC in 25 gals of water	See methods of application and safety restrictions for cyfluthrin (#1) above.

Insecticide ²	Spray Concentration and Mixing Instructions	Methods of Application and Safety Restrictions
10. trichlorfon (Dipterex) 80% SP, CR, LE	Mix 1 pound of 80% SP in 8 gals. of water	Apply 1 gallon/500 sq. ft. Remove animals before treatment. Allow spray to dry before returning animals. Do not contaminate water, feedstuffs, feed handling equipment, or milk handling equipment. See methods of application and safety restrictions for cyfluthrin (#1) above.
SPACE SPRAYS (Aerosols, Fogs and Mist Sprays)³		
11. dichlorvos (Vapona or DDVP) 1% Ready to use Animal Spray Solution OR 2 lbs a.i. per gal Overtime(23.4%) EC, OP, LE	0.5% or 1%. Apply ready to use fogging solution or mix 1 pt EC in 3 gals or 6 gals of water.	Apply 1 pt of 1% solution or 1 qt of 0.5% solution per 8,000 cubic ft as a fog or mist. Repeated applications will provide adult fly suppression. Do not use more often than once every 24 hours. Do not use if animals have been treated with other insecticides within 8 hours. Do not apply directly to animals. Close all doors and windows when fogging. Do not contaminate feed, water, milk or milking equipment.
12. permethrin (Gardstar, Insectrin) 5.7% EC, SPY, ME	Mix 1 pt of 5.7% EC in 6 1/4 gals of diesel fuel or mineral oil OR mix 10 to 45 ml in 1 gal. of water..	Apply fog at 4 fl ozs per 1,000 cubic feet of air space in confined facility. Repeat as needed.
13. pyrethrin (0.1 to 1.0%) + synergist (0.5 to 5.0) NPY, HE	Ready to use	Apply fogs or spray mists at 1 fl oz per 1,000 cubic ft as fine atomized spray. Repeat as needed.
BAITS		
14. methomyl (Apache, Golden Malrin) Bait, CR, HE	Ready to use as a dry bait.	As a dry bait: Scatter on floors, walkways, etc., throughout operation, but away from animals. Apply heavy (about 1/4 lb per 500 to 1,000 sq ft) until flies are suppressed. Wear rubber gloves when applying baits. Do not allow workers on treated floors without shoes. Do not allow animals to come in contact with baits.
15. nithiazine (Quick Strike) 1% fly abatement strip	Ready-to-use	Hang one strip per 100 ft ² or 300 ft. ² depending on fly population in enclosed areas that are protected from rain.
16. trichlorfon (Sugarcide) 1.0% Bait, OP, LE	Ready to use as a dry bait. As a liquid bait: Mix 4 ozs in one gallon of water, and two cups of corn syrup or one pound of sugar and stir until dissolved.	As a dry bait: Apply and follow precautions as for methomyl (#14) above. As a liquid bait: Sprinkle the solution in a 4 to 10 inch wide band or apply the solution to burlap bags or squares of hard surface material and place on floors, window sills of farm buildings and outside buildings when fly population is intense.

¹ Residual sprays can be applied as spot sprays to control maggots in manure accumulations if permitted by the EPA label.

² HE = highly effective, LE = less effective or effectiveness not established, OP = organophosphate, CR = carbamate, SPY = synthetic pyrethroid, NPY = natural pyrethrum, CH = organochlorine, chlorinated hydrocarbon, SP = soluble powder.

³ Space sprays are designed to kill only adult house flies that are present when the fog or mist is applied. There is little or no residual insecticide deposit remaining after the application. Fogs or mists must come in contact with the fly. These materials are especially effective in enclosed areas where air movement is minimal. Heavy mists can offer good adult house fly kill in open areas such as in feed lots.

Dairy Livestock Pest Control

The systemic insecticides recommended for cattle grub control on non-lactating dairy cattle are cholinesterase inhibiting drugs; therefore, do not use them on animals simultaneously or within a few days before or after treatment with or exposure to cholinesterase inhibiting drugs, pesticides or chemicals.

Precautions when using insecticides:

- Do not treat sick, convalescent or stressed livestock, or animals less than 3 months old
- Do not spray animals for 10 days before or after shipping or weaning, or after exposure to contagious and infectious diseases.
- Do not spray in a confined, non-ventilated area.
- Do not apply in conjunction with oral drenches, other internal medications or other insecticides.

Insecticides for Cattle Grub Control on Non-Lactating Dairy Cattle

(Do NOT Treat Lactating Dairy Cattle With Any of These Insecticides)

Dairy

Insect and Insecticide	Min. Days from Last Application to Slaughter	Formulation & Strength	Amount of Formulation Per Animal or Area	Where and When to Apply Precautions (by nos. below) See Safety Restrictions
CATTLE GRUBS (Non-Lactating Dairy Animals) (Use one only once from late July to no later than Nov. 1 Lice & Horn fly control results with sprays & pour-ons also)				
SPRAYS AND DIPS				
Coumaphos OP, ME		0.37% WP or EC spray. Mix 12 to 16 lbs of 25% WP in 100 gals of water or 15 ozs of 1 lb a.i. per gal EC (11.6%) in 4 gals of water		Apply as a high pressure spray (250-350 psi) to wet skin, not just the hair. Apply approximately 1 gal of spray per mature animal. Do not treat dry dairy cattle within 14 days of parturition. No waiting period for slaughter.
		0.25% WP dip. Mix 8 lbs 25% WP in 100 gals of water		Mix dip with WP formulation only. Dip only once. Dip to wet animal's skin thoroughly. Do not treat dry dairy cattle within 14 days of parturition. No waiting period for slaughter.
POUR-ON				
Coumaphos OP, ME (Co-Ral)		4% pour-on Ready to use soln		Apply 1/2 fl oz per 100 lbs animal body weight. Apply evenly along backline. Do not treat dry dairy cattle within 14 days of parturition. No waiting period for slaughter.
Famphur OP, ME (Warbex)		13.2% pour-on Ready to use soln		Pour 1 fl oz per 200 lbs body weight along backline. Do not apply more than 4 fl ozs per animal. Do not treat dry dairy cattle within 21 days of parturition. Do not slaughter within 35 days after treatment. Do not treat after Nov. 1. Do not repeat treatment.
Fenthion OP, ME (Tiguvon)		3% pour-on Ready to use soln		Pour 1/2 oz per 100 lbs animal body weight along backline. Do not retreat within 35 days. After 35 days retreat for lice if needed. Do not treat dairy cattle within 28 days of parturition. Waiting period for slaughter: 35 days for single application, if a second application is made for louse control do not slaughter within 45 days of the second treatment.

Dairy

Insect and Insecticide	Min. Days from Last Application to Slaughter	Formulation & Strength	Amount of Formulation Per Animal or Area	Where and When to Apply Precautions (by nos. below) See Safety Restrictions
CATTLE GRUBS (cont'd)				
Trichlorfon OP, ME (Neguvon)		8% pour-on Ready to use soln		Apply 1/2 fl oz per 100 lbs animal body weight evenly along animal's backline. Do not treat dry dairy cattle within 7 days of parturition. Do not treat dairy cattle within 21 days of slaughter.
FACE FLY (Face and Backrubbers give horn fly, lice, and some grub control if grub material used)				
Coumaphos (Co-Ral)	0	1% oil 11.6% EC 9 3/4 ozs (1 lb a.i.) in 1 gal #2 diesel fuel or #2 furnace oil	1 gal/20 ft cable	Saturate <u>face/backrubbers</u> ; construct backrubbers to permit animal to rub face. See UT Pub 658, Mineral Box and Face Fly Duster, for face duster construction plan. 3,6 Recharge rubbing device at least every 14 days. One 20 ft backrubber is sufficient for 50 head or fewer cattle. Do not treat calves 6 months old.
		5% Dust	8 lbs/dust bag	
dichlorvos (Vapona)	0	23.4% EC 1 qt/6 gals	1-2 fl ozs/animal/day	Apply as a fine mist to cover all body especially head, back, legs and sides. Do not wet skin, only hair. Do not apply to animals less than 6 months old. Do not apply in combination with trichlorfon.
permethrin		Synergized Delice 1.0% Ready to use	Apply 0.5 fl oz (15cc) per 100 lbs body weight of animal up to a maximum of 5 fl ozs for any one animal.	Pour-on: Pour correct dose along back and down face. Ready to use spray: Use undiluted in a mist sprayer to apply correct dose. Apply directly to neck, face, back, legs and ears. Backrubber: Mix one pint per gal of #2 diesel fuel or mineral oil. Keep rubbing device charged. Results improved by daily forced use. Repeat spray and pour-on treatments as needed, but not more than once every 14 days.
		Backrubber / Facerubber 5.7% EC 1 qt/10 gals diesel oil	1 gal/20 ft cable	Keep rubbing device charged with 1 gal mixture per 20 feet of cable. Cattle should be forced to use rubbing device daily.
		5.7% EC Spray 1 qt/25 gals	1-2 qts/animal	Use a high pressure spray. Retreat as needed, but no more than once every 14 days.
		5.7% EC spray 1 qt / 1 1/2 gals	1-2 ozs/animal	Low pressure spray to face and shoulders of animal. Repeat as needed but not more often than every 14 days.
		0.25% Dust	2 ozs (5 Tbs)/animal	Repeat as needed, but not more often than every 14 days.
Pyrethrins + Synergist	0.075% 0.75%	Oil soln. or EC Spray	1-2 fl ozs	As mist spray daily to all body parts especially head and neck, with hand or automatic sprayer. Use as purchased. 3 Do not wet skin.
Stirofos Rabon	0	3% D Ready to use	2 ozs/animal	Rub in lightly or apply in suspended self-treatment dust bags. Use in dust bag face/backrubbers.
Rabon Oral Larvacide		Mix Rabon 7.76% Oral Larvacide Pre-mix in feed or mineral mixes or available as ready-to-use.	70 mg/cwt body wt	Follow label directions. In complete or concentrate feed and block or mineral mix. Use in conjunction with other controls.

Dairy

Insect and Insecticide	Min. Days from Last Application to Slaughter	Formulation & Strength	Amount of Formulation Per Animal or Area	Where and When to Apply Precautions (by nos. below) See Safety Restrictions
FACE FLY (cont'd)				
EAR TAGS				
cyfluthrin (Cutter Gold)			1 tag on each ear	Attach when flies build up. Remove tags at end of season and before slaughter.
ectrin Ear Tags (fenvalerate)				
fenthion (Cutter Blue)				
fenvalerate (Ectrin)		8%		
flucythrinate Gardian		7.5%		
lambdacyhalothrin (Non-lactating Dairy only) (Saber)				
permethrin (Insecta-Gard, Gard Star, Ear Force)				
pirimiphos-methyl (Non-lactating Dairy only) (Tomahawk)				
zetacypermethrin (Pythozeta Gard)		10%		
HORN FLY (Horn fly and grub controls aid in face fly control)				
Coumaphos (Co-Ral)	0	EC, 0.5% WS	2 qts (nonlactary dairy)/100 gals	To backs every 3 weeks as needed. 2,3
		1% D Ready-to-use	Not more than 2 ozs (6 level Tbs)/animal	Dust into the hairs over the head, neck, shoulders, back and tailhead. Do not treat animals in a non-ventilated area. Do not apply to sick, convalescent or stressed animals. Repeat as needed.
		1% D Ready-to-use		Apply 4 go 10 lbs. in self-treatment cotton cloth or doubled burlap bags. Suspend where animals will treat themselves daily, such as near mineral or salt blocks and in exit of milking barn. Bags should hang 4 to 6 inches below topine of cattle. Protect bags from weather. Do not hang bags over feed, mineral or water troughs.
		25 WP	1 qt (lactating dairy)/100 gals	
		11.6% EC (1 lb. a.i./gal) Mix 1% oil soln. 9 3/4 ozs/1 gal #2 diesel oil or #2 furnace oil	1 gal/20 ft cable	Saturate backrubbers & facerubber with 1 gal. mixture per 20 ft. of cable. 2,3. Cattle must use rubbing device daily. Recharge at least every 14 days. One 20 ft backrubber is sufficient for 50 head or fewer cattle. Hang so cattle cannot straddle device. Do not treat calf 6 months old.
Eprinomectin (Eprinex)		Pour-on 5 mg eprinomectin/ml	1 ml / 22 lbs body wt.	Administer to topline of cattle in a narrow strip extending from the withers to the tailhead.
HORN FLY (cont'd)				

Dairy

Insect and Insecticide	Min. Days from Last Application to Slaughter	Formulation & Strength	Amount of Formulation Per Animal or Area	Where and When to Apply Precautions (by nos. below) See Safety Restrictions
Malathion	0	EC or WP 1.25% WS	2 qts	To backs every 3 weeks as needed. 1,4
		2% oil	1 gal/20 ft cable	Saturate backrubbers. 1,4
		4% Dust Ready-to-use	2 oz (4 Tbs)/animal	Sprinkle on back and neck every 10-14 days if needed. Dust after milking only. Do not treat animals under one month old.
		5% Dust Ready-to-use	1.5 ozs (3 Tbs)/animal	
Methoprene (Altosid) 0.02% feed mixture		Ready to use	Consume 0.25 to 0.5 lb per 100 lbs body weight each month.	Feed this oral insect growth regulator as free choice mineral or mixed supplements for pasture cattle early in the spring before horn flies appear.
methoxychlor		50WP Ready to use	1 Tbs/animal	Sprinkle and rub in lightly. Treat back and upper sides every 3 weeks if needed. Dust only after milking.
permethrin		5.7% EC 1 qt/25 gals	1-2 qts/animal	Thoroughly spray with a high pressure spray. Retreat as needed but no more than once every 14 days.
		5.7% EC 1 qt/1 1/2 gals	1-2 ozs	Apply as a low pressure spray to face and shoulders of animal. Retreat as needed but not more often than every 14 days.
		0.25% Dust Ready to use	2 ozs (5 Tbs)/animal	Retreat as needed but not more often than every 14 days.
		0.25% Dust (Bag) Ready to use	4 to 6 lbs. in a self-treatment cotton cloth.	Suspend dust bags where animals will treat themselves daily, such as near mineral stations, salt blocks or in milking barn exit. Hang bags 4-6 inches below topline of cattle. Do not hang bags over feed, mineral or water troughs. Protect bags from weather.
		Backrubber & Facerubber 5.7 % EC 1 qt/10 gals diesel oil		Keep rubbing device charged with 1 gal. mixture per 20 feet of cable. Cattle should be forced to use rubbing device daily.
permethrin (Synergized Delice)		Ready to use 1% Soln.	0.5 fl oz (15cc)/100 lbs body max. 5 fl ozs/animal	Pour-on: pour correct dose along back and down face. Ready to use spray: use undiluted in a mist sprayer to apply correct dose. Apply directly to neck, face, back, legs and ears. Backrubber: mix one pint per gal of #2 diesel fuel or mineral oil. Keep rubbing device charged. Best results by daily forced use. Repeat spray and pour-on treatments as needed, but not more than once every 14 days.
Pyrethrins + Synergist 0.05% 0.5%		EC Spray	1-2 fl qts	As <u>wet spray</u> every 3-7 days as needed.
Pyrethrin Synergist to 1% Oil.Soln or EC Spray		Oil soln. Ready to Use or EC Spray Mix according to label directions.	1-2 fl ozs	As <u>mist spray</u> daily with hand or automatic sprayer.
Rabon		50 WP: 1/2 lb in 9 gals water		

Dairy

Insect and Insecticide	Min. Days from Last Application to Slaughter	Formulation & Strength	Amount of Formulation Per Animal or Area	Where and When to Apply Precautions (by nos. below) See Safety Restrictions
HORN FLY (cont'd)				
Rabon Oral Larvacide feed mixture		7.76% Pre-mix	70 mg/cwt body wt	Follow label directions. In complete or concentrate feed and block or mineral mix. Use in conjunction with other controls. Constant consumption is important to monitor.
Stirofos (Rabon)	0	3% D Ready-to-use	2 ozs/animal	Rub in lightly or apply in suspended self-treatment dust bags. Repeat as needed. Face/backrubbers.
Dichlorvos Vapona		23.4% EC (2 lb. a.i. / gal) 1 qt/6 gals	1-2 fl ozs daily	Apply not more than 2 fl. ozs. daily as a light mist spray to cover all body parts, especially head, back, legs and sides. 7 Do not wet skin only hair. Do not apply to animals less than 6 months old. Do not apply in combination with trichlorfon.
EAR TAGS				
cyfluthrin (Cutter Gold)			1 tag on each ear	Attach when flies build up. Remove tags at end of fly season.
flucythrinate (Guardian)		7.5%		
lambdacyhalothrin (Saber)				
permethrin (Gard Star, Ear Force)				
pirimiphos-methyl (Tomahawk)				(Nonlactating Dairy)
Fenvalerate Ectrin		8%		
LICE Use same materials and formulations as for horn flies. Follow same time limits between applications and slaughter. Spray thoroughly. Repeat in 2-3 weeks, if needed. Backrubber used for flies and lice control.				
Amitraz (Tactic)		See label 12.5% EC 1 qt/100 gals	Spray completely	Apply up to 2 gals of spray for a fully grown animal. Penetrate spray to skin until run-off. Spray legs, udder, tail regions, head, ears, shoulder area and neck. A second application may be needed 10 to 14 days later. No waiting period between application and slaughter. Use within 6 hrs of mixing.
Coumaphos (Co-Ral)		1% D	No more than 2 ozs (6 level TBS.) / animal	Dust evenly into hair over the head, neck, shoulders, back and tailhead. Do not treat animals in a non-ventilated area. Do not apply to sick, convalescent or stressed animals. Repeat as needed.
		1% D	Dust bag Ready to use	Apply 4-10 lbs in suspended, self-treatment dust bags made of cotton cloth or doubled burlap. Suspend where animals will treat themselves daily, such as near minerals or salt blocks and in exit of milking barn. Bottom of bag should hang 4-6 inches below topline of cattle. Protect duster from weather. Do not hang bags over feed, mineral or water troughs. Repeat as needed.

Dairy

Insect and Insecticide	Min. Days from Last Application to Slaughter	Formulation & Strength	Amount of Formulation Per Animal or Area	Where and When to Apply Precautions (by nos. below) See Safety Restrictions
LICE (cont'd)				
Coumaphos (Co-Ral) (Cont'd)		Spray 11.6% EC 1 1/4 oz./4 gals of water	Spray to run-off	Do not apply to sick, convalescent or stressed livestock or to animals less than 3 months old. Do not spray animals for 10 days before or after shipping or weaning, or after exposure to contagious and infectious diseases. Do not spray in a confined, non-ventilated area. Do not apply in conjunction with oral drenches or other internal medications nor with natural pyrethrins or synthetic pyrethroids or their synergists or with other cholinesterase inhibitors.
		Spray 25% WP ½ lb (3 cups) / 50 gals. water	Spray to run-off	
Eprinomectin (Eprinex)		Pour-On 5 Mg eprinomectin /ml	1 ml. / 22 lbs. of body wt.	Administer to topline of cattle in a narrow strip extending from the withers to the tailhead.
fenvalerate (Ectrin)		10 WDL 2 ozs/5 pts	2-3 ozs	Spray on head, neck, legs and back line. Do not treat more frequently than every 4 days.
		10 WDL 4 ozs/6 gals	1-2 pts	Spray as above. Do not treat more frequently than weekly.
Permethrin	0	5.7% EC 1 qt/100 gals	Spray entire animal thoroughly	Retreat 14-21 days later, if needed. Do not retreat more often than once every 14 days.
		0.25% Dust Ready to use		Apply 4 to 10 lbs in self-treatment cotton cloth, doubled burlap bags or commercial dust bags. Suspend where animals will treat themselves daily, such as near mineral stations, salt blocks or in milking barn exit. Bags should hang 4 to 6 inches below topline of cattle. Protect bags from weather. Do not hang bags over feed, mineral or water troughs.
		0.25 % Dust Ready-to-use	Up to 2 ozs. (5 TBS.) / animal	For lice a second treatment may be needed 14-21 days later. Retreat as needed but not more often than every 14 days.
Synergized Delice (permethrin)		Ready to use	Apply 0.5 fl oz (15cc) per 100 lbs body weight of animal up to a maximum of 5 fl ozs for any one animal.	Pour-on: Pour correct dose along back and down face. Ready to use spray: Use undiluted in a mist sprayer to apply correct dose. Apply directly to neck, face, back, legs and ears. Backrubber use: Mix one pint per gal of #2 diesel fuel or mineral oil. Keep rubbing device charged. Results improved by daily forced use. Repeat spray and pour-on treatments as needed, but not more than once every 14 days.
Pyrethrin + Synergist		0.25% + 0.25% EC spray	Apply thoroughly as wetting spray	Repeat after 2-3 weeks, if needed.
Stirofos (Rabon)	0	3% D	2 ozs	Apply 2 ozs of dust per animal by hand or duster to thoroughly penetrate hair coat.
			Dust bag	Apply in dust bags which are hung and protected from rain in dusting stations where cattle are forced to use them. Some control will be obtained by free choice use.

Dairy

Insect and Insecticide	Min. Days from Last Application to Slaughter	Formulation & Strength	Amount of Formulation Per Animal or Area	Where and When to Apply Precautions (by nos. below) See Safety Restrictions
HOUSE FLY				
Dichlorvos (Vapona)		23.4% EC (2 lb. a.i. / gal) 1 qt/6 gals	1-2 fl ozs daily	Apply no more than 2 fl. ozs. daily as a light mist spray to cover all body parts, especially head, back, legs and sides. 7 Do not wet skin only hair. Do not apply to animals less than 6 months old. Do not apply in combination with trichlorfon.
Permethrin Synergized Delice		1.0% Ready-to-use	Apply 0.5 fl oz (15cc) per 100 lbs body weight of animal up to a maximum of 5 fl ozs for any one animal.	Pour-on: Pour correct dose along back and down face. Ready to use spray: Use undiluted in a mist sprayer to apply correct dose. Apply directly to neck, face, back, legs and ears. Backrubber use: Mix one pint per gal of #2 diesel fuel or mineral oil. Keep rubbing device charged. Results improved by daily forced use. Repeat spray and pour-on treatments as needed, but not more than once every 14 days.
Stirofos Rabon Oral Larvicide Feed Mixture		7.76% Oral Larvicide Pre-mix Ready-to-use		Feed the appropriate larvicidal feed or mineral mix to milking cows to prevent the development of fly larvae in manure. Follow manufacturers instructions to insure adequate amount are consumed.
HOUSE FLIES (Cond't)		Ear Tags		
flucythrinate (Guardian)		7.5%		
Fenvalerate (Ectrin)		8%		
STABLE FLY, HORSE FLY, MOSQUITO				
Pyrethrin Synergist	0.1% 1.0%	Mix according to label		Apply 1 to 2 qts as a wet spray every 2 to 3 days or apply 1 to 2 fl ozs as a light mist spray daily with hand or automatic sprayer.
Synergized Delice (permethrin)		Ready to use		Apply 0.5 fl oz (15cc) per 100 lbs body weight of animal up to a maximum of 5 fl ozs for any one animal. Pour-on: Pour correct dose along back and down face. Ready to use spray: Use undiluted in a mist sprayer to apply correct dose. Apply directly to neck, face, back, legs and ears. Backrubber use: Mix one pint per gal of #2 diesel fuel or mineral oil. Keep rubbing device charged. Results improved by daily forced use. Repeat spray and pour-on treatments as needed, but not more than once every 14 days.
dichlorvos (Vapona)		23.4% EC spray 1% EC Spray 1 qt/6 gals	No more than 2 fl ozs daily	Apply as a light mist spray to cover all body parts, especially head, back, legs and sides. Do not wet skin, only hair of animal. Do not apply to animals less than 6 months old. Do not apply in combination with trichlorfon.

Dairy

Insect and Insecticide	Min. Days from Last Application to Slaughter	Formulation & Strength	Amount of Formulation Per Animal or Area	Where and When to Apply Precautions (by nos. below) See Safety Restrictions
STABLE FLY, HORSE FLY, MOSQUITO (cont'd)				
permethrin Synergized Delice		Ready to use		Apply 0.5 fl oz (15cc) per 100 lbs body weight of animal up to a maximum of 5 fl ozs for any one animal. Pour-on: Pour correct dose along back and down face. Ready to use spray: Use undiluted in a mist sprayer to apply correct dose. Apply directly to neck, face, back, legs and ears. Backrubber use: Mix one pint per gal of #2 diesel fuel or mineral oil. Keep rubbing device charged. Results improved by daily forced use. Repeat spray and pour-on treatments as needed, but not more than once every 14 days.
		5.7% EC 1 qt/25 gals	1-2 qts/animal	Thoroughly spray with a high pressure spray. Retreat as needed but no more than once every 14 days.
STABLE FLY				
Permethrin		5.7% EC 1 qt/25 gals	1-2 qts/animal	Apply as a high pressure spray. Retreat as needed, but no more than once every 14 days.
Ear Tags				
Fenvalerate (Ectrin)		8%		
flucythrinate (Gardian)		7.5%		
stirofos (Rabon) Oral Larvicide Feed Mixture		7.76% Oral Larvicide Pre-mix Ready-to-use		Feed the appropriate larvicidal feed or mineral mix to milking cows to prevent the development of fly larvae in manure. Follow manufacturers instructions to insure adequate amount are consumed.
TICKS				
Coumaphos (Co-Ral)		3% spray foam		For wound infesting maggots or as a preventive, treat wound and surrounding area with light but thorough coverage. For ear ticks, treat ear and surrounding head area. Repeat as needed. Do not treat animals in a non-ventilated area. Do not apply to sick, convalescent or stressed animals.
		5% Dust		Repeat as needed. For ear ticks, treat in ear and surrounding head area. Provide thorough ventilation while dusting.
Permethrin		5.7% EC 1 qt/25 gals	1-2 qts/animal	Apply 1-2 qts diluted spray thoroughly per animal as a high pressure spray. Retreat as needed, but no more than once every 14 days.
Pyrethrin Synergist		EC spray Ready-to-use	1-2 qts as a wet spray	Spray every 2-3 days or apply 1-2 fl ozs as a light mist spray daily with hand or automatic sprayer.

Dairy

Insect and Insecticide	Min. Days from Last Application to Slaughter	Formulation & Strength	Amount of Formulation Per Animal or Area	Where and When to Apply Precautions (by nos. below) See Safety Restrictions
WOUND-INFESTING MAGGOTS				
Coumaphos (Co-Ral)		5% Ready-to-use		Apply dust to infested wound and surrounding area. Repeat as needed. Provide thorough ventilation while dusting.
		3% Spray Ready-to-use		For wound infesting maggots or as a preventive, treat wound and surrounding area with light but thorough coverage. Repeat as needed. Do not treat animals in a non-ventilated area. Do not apply to sick, convalescent or stressed animals.
MITES (Chorioptic)				
Eprinomectin (Eprinex)		Ready-to-use	1 ml. / 22 lbs of body weight.	Administer pour-on to topline of cattle in a narrow strip extending from the withers to the tailhead.
FLIES IN DAIRY MILKING PARLORS				
Rabon		2%	1 gal soln/500 sq ft	For dry, white-washed wood or concrete block.
			1/2 gal soln/500 sq ft	For masonite or galvanized sheet metal
		1%	1 gal soln/500 sq ft	For unpainted wood or painted concrete block surfaces.
Ravap		1-2%	1 gal/500-1000 sq ft	
Vapona		0.5-0.1%	1 qt of 0.5%/8000 cu ft 1 pt of 1%/8000 cu ft	Before applying, reduce air movement by closing doors, windows and other openings.

Safety Restrictions - Dairy

1. Coumaphos and malathion may be applied to dry dairy animals, with the limitations indicated below. Observe precautions on product labels as well as those given here.
2. Coumaphos (Co-Ral) and trichlorfon (Neguvon) are systemic insecticides. If you need a grub control, do not spray or pour on any of the other materials. If you spray or pour on one of these insecticides, do not treat the same animal with any of the other materials.
3. Do not treat animals less than 3 months old with coumaphos (Co-Ral). Spray animals 3-6 months old lightly. Do not use with synergized pyrethrins, allethrin or synergist. Do not spray animals or apply pour-on for 10 days before or after shipping or weaning, or after exposure to disease. Do not apply in conjunction with oral drenches or other medications such as phenothiazine, or with other organic phosphates. Do not apply to dry dairy animals within 14 days of freshening.
4. Do not use malathion on dairy calves less than one month old. Do not treat lactating dairy animals; do not treat dairy animals within 14 days of freshening. Do not use backrubbers with malathion on dairy animals.
5. Do not use trichlorfon (Neguvon) on lactating dairy animals, or to dry cows within 7 days of freshening. Do not treat animals with trichlorfon (Neguvon) less than 3 months old, sick, convalescent, or stressed animals. Do not treat 10 days before or after shipping, weaning, or after exposure to contagious diseases. Do not apply in conjunction with oral drenches, other internal medications, or other organic phosphates.
6. Dippers used with pour-ons for grub control should be stored in a safe place so no one will use it as a drinking dipper.
7. Do not apply more than 2 fl. ounces per day per animal when using mist sprays containing dichlorvos (DDVP). Do not wet the hide with the spray.
8. Do not apply coumaphos (Co-Ral) on backrubbers in conjunction with oral drenches or other internal medications, such as phenothiazine, or with other organic phosphates. Do not use with synergized pyrethrins, allethrin or synergist. Suspend backrubber at a height that will prevent straddling.

Abbreviations Used in Chart

B	=	Bait
D	=	Dust
EC	=	Emulsion Concentrate
Oil	=	Mix with Diesel or Fuel Oil
PO	=	Pour On
Soln.	=	Solution
SP	=	Spot On
WP	=	Wettable Powder
WS	=	Water-Mixed Spray

DAIRY CATTLE, NON-LACTATING (DRY), CATTLE GRUB CONTROL INSECTICIDES

If cattle grubs are a problem in your dairy herd, treat infested animals. For most effective grub control treat cattle with one of the approved animal systemic insecticides listed in the Table. "Insecticides for Cattle Grub Control on Non-Lactating Dairy Cattle." You get best results by treating infested cattle early during the migration of the grubs through the tissues of the animal. Treat as soon as possible after the activity of the adult heel fly has ceased or as least six weeks before the expected appearance of the grubs in the animal's back.

Precautions:

The systemic insecticides recommended for cattle grub control on non-lactating dairy cattle are cholinesterase inhibiting drugs; therefore, do not use them on animals simultaneously or within a few days before or after treatment with or exposure to cholinesterase inhibiting drugs, pesticides or chemicals.

Do not treat sick, convalescent or stressed livestock, or animals less than 3 months old.

Do not spray animals for 10 days before or after shipping or weaning, or after exposure to contagious and infectious diseases.

Do not spray in a confined, non-ventilated area.

Do not apply in conjunction with oral drenches, other internal medications or other insecticides.

DO NOT TREAT LACTATING DAIRY CATTLE WITH ANY OF THESE INSECTICIDES

INSECTICIDES FOR CATTLE GRUB CONTROL ON NON-LACTATING DAIRY CATTLE

INSECTICIDE	FORMULATION AND MIXING INSTRUCTIONS	APPLICATION INSTRUCTIONS AND RESTRICTIONS
SPRAYS AND DIPS		
1. COUMAPHOS OP,ME	0.37% WP or EC spray. Mix 12 to 16 lbs. or 25% WP in 100 gals. of water or 15 ozs. of 1 lb. a.i. per gal. EC (11.6%) in 4 gals of water.	Apply as a high pressure spray (250 to 350 p.s.i.) to wet skin, not just the hair. Apply approximately 1 gal. of spray per mature animal. Do not treat dry dairy cattle within 14 days of parturition. No waiting period for slaughter.
	0.25% WP dip. Mix 8 lbs. 25% WP in 100 gals. of water.	Make dip with WP formulation only. Dip only once. Dip to wet animal's skin thoroughly. Do not treat dry dairy cattle within 14 days of parturition. No waiting period for slaughter.
POUR-ON		
1. EPRINEX EP,ME	5 mg eprinomectin/ml pour-on. Ready-to-use	Administer pour-on to topline of cattle in a narrow strip extending from the withers to the tailhead. Apply 1 ml. per 22 lbs. of animal body weight. Waiting period: 0 days for milking and slaughter.
2. FAMPHUR OP, ME	WARBEX 13.2% pour-on. Ready-to-use solution.	Pour 1 fl. oz. per 200 lbs body weight along backline. Do not apply more than 4 fl. ozs. per animal. Do not treat dry dairy cattle within 21 days of parturition. Do not slaughter within 35 days after treatment. Do not treat after November 1. Do not repeat treatment.
3. FENTHION OP, ME	TIGUVON 3% pour-on. Ready-to-use solution.	Pour ½ oz. per 100 lbs animal body weight along backline. Do not re-treat within 35 days. After 35 days re-treat for lice if needed. Do not treat dairy cattle within 28 days of parturition. Waiting period for slaughter: 35 days for single application, if a second application is made for louse control do not slaughter within 45 days of the second treatment.

Applications of systemic grubicides will also control blood sucking lice nymphs and adults. Lice eggs may hatch or untreated cattle may serve as source of reinfestation. Flies will likely migrate in to reinfest treated cattle.

Swine Pest Control

Swine

Pest and Product	Dilutions	Application Rate	Remarks
HOG LICE		SPRAYS	
1. Amitraz (Tactic) ME 12.5%	0.06% Mix 1 qt. of 12.5% EC in 50 gals. of water or mix 1 fl. oz. EC in 2 gals. of water	Apply a coarse spray to point of runoff. Pay strict attention to jowls, legs, inside of ears and the underside of the body. Use 70-150 psi. Spray must wet skin until runoff. Piglets (weaners) can be dipped.	Remove feed from pen and cover drinking bowls. Remove and destroy bedding. Hose out feces and excess feed. Use Tactic solutions within 6 hours of mixing. Treat each animal thoroughly. Spray walls, floor and fittings in the pen. Repeat 7 to 10 days after the first treatment for mange mites and 10 - 14 days for lice. Do not treat animals more than 4 times per year. 1 day from last application until slaughter.
2. Coumaphos (Co-Ral) OP, ME (Co-Ral E.L.I. 11.6% is a restricted- use insecticide 5.8% EC 25% WP	0.06% Mix 2 lbs. of 25% WP in 100 gals. of water OR mix 2 qts. of 11.6% EC in 100 gals. of water OR mix 2 qts. of 5.8% EC in 50 gals of water. Double the dosage of Co-Ral in water for tick control.	Wet to point of run-off. Repeat as needed.	Do not treat sick, convalescent or stressed animals. Do not spray animals for 10 days before or after shipping or weaning, or after exposure to contagious or infectious diseases. Do not spray in a confined, non-ventilated area. Do not apply in conjunction with oral drenches or other internal medication, or with natural or synthetic pyrethroids or their synergists, or with other organophosphates or cholinesterase inhibiting drugs, pesticides or chemicals. Zero (0) day from last application to slaughter.
3. Lindane CH, ME 25% WP (Restricted-use)	0.05% Mix 1 lb. of 25% WP OR mix 2 pints of 20% EC in 100 gals. of water.	Wet to point off or runoff.	Repeat sprays every 2 to 3 weeks if needed. Do ot treat pigs before weaning. Do not treat sows within 2 weeks of farrowing or for a least 3 weeks thereafter. Do not treat thirsty, overheated or sick animals. Do not treat animals under 3 months of age.
4. Malathion OP, ME 57% EC 25% WP	0.5% Mix 1 gal. of 57% EC OR mix 16 lbs. of 25% WP in 100 gals of water.	Wet to point of runoff.	Treat every 2 to 3 weeks if needed. Sprayed hogs should be kept out of sun and wind for a few hours after treatment.
5. Methoxychlor CH, ME 50% WP	0.5% Mix 8 lbs of 5)% WP in 100 gals water	Wet to point of run-off	Spray animals thoroughly. Repeat after 3 weeks, if needed.

Swine

Pest and Product	Dilutions	Application Rate	Remarks
6. Permethrin SP, ME (Atroban, Ectiban, Gardstar, Insectrin, Permethrin) 5.7% EC, 10% EC, 11% EC, 40% EC, 42.5% EC	0.025- 0.054% Mix 1 pt of 11% EC OR mix 1 qt. of 5.7% EC OR mix 1 cup 10% EC OR mix 50- 118 ml or 40% EC OR mix 4 ozs. of 42.5% EC in 25 gals. of water.	Wet thoroughly (Approximately 1 pint per animal)	Spray entire animal thoroughly. Pay special attention to ears and hard to spray areas. Make a second application 14 days later if needed. 5 days from last application until slaughter.
7. phosmet (Del-Phos, Lintox- HD, Prolate) OP, ME 11.6% EC	0.06% Mix 1 qt in 25 gals water	Wet to point of run-off. Wet thoroughly to skin.	See 32. Single application should be effective. Should a second application be needed, it may be made 14 days following the first treatment. Do not treat suckling pigs. Do not treat within 1 day of slaughter.
8. stirofos or tetrachlorvinphos OP, ME (Rabon) 50% WP	0.5% Mix 4 lbs. of 50% WP in 50 gals. of water.	1 to 2 qts. Wet animal thoroughly	Apply as a coarse spray. Repeat in 2 weeks, if needed. Zero (0) days from application to slaughter.
HOG LICE		DIPS	
9. Lindane (Restricted Use) CH, ME 25% WP	0.05% Mix 1 lb of 25% WP in 100 gals of water	Immerse entire animal	Repeat dips every 2 to 3 weeks, if needed. Do not treat pigs before weaning. Do not treat sows within 2 weeks of farrowing or for at least 3 weeks thereafter. Do not treat animals under 3 months of age. Do not treat within 60 days of slaughter.
10. Malathion OP, ME 57% EC 25% WP	0.5% Mix 1 gal of 57% EC OR mix 16 lbs. of 24% WP in 100 gals of water	Immerse entire animal	Treat every 2 to 3 weeks, if needed. Zero (0) days from last application to slaughter.
11. Methoxychlor OP, ME 50% WP	0.5% Mix 8 lbs of 50% WP in 100 gals of water	Immerse entire animal	Repeat after 2 to 3 weeks, if needed. Zero (0) days from last application to slaughter.
12. Permethrin (Gardstar) SY, ME 40% EC	0.025-0.05% Mix 50-118 ml in 25 gals. of water.	Immerse entire animal.	Dip animals including ears. Spray pen floors, sides and bedding. Repeat at 14 days.
HOG LICE		DUSTS	
13. Malathion OP, ME 4 to 5% D	Ready-to-use	Dust thoroughly	Treat every 2 to 3 weeks, if needed. For pigs under one month of age apply 1/4 to 1/2 Tbs.

Swine

Pest and Product	Dilutions	Application Rate	Remarks
14. Permethrin (Ectiban, Insectrin) PY, ME 0.25% D	Ready-to-use	Dust thoroughly	Apply up to 1 oz. (2 ½ Tbs.) Per animal. Pay particular attention to ears and other hard to reach areas. Re-treat 14 days later if needed.
15. Phosmet (Prolate) OP, ME 1% D	Ready-to-use	Dust thoroughly. Apply ½ to 1 oz. of dust per animal to backline and lightly rub in. Repeat in 10 to 14 days or as needed.	Dust animals thoroughly. See restrictions under Co-Ral in No. 2 above.
16. Stirofos or tetrachlorvinphos (Rabon) OP, ME	Ready to use	Dust thoroughly. Use 3 to 4 ozs.	Apply by hand or with conventional hand or power duster. Do not retreat with more than 2 ozs. per head within 14 days. Heavily infestations may require bedding be treated at one lb. per 150 ft. ²
HOG LICE		INJECTABLE	
17. Ivermectin (Ivomec) ME 1%	Ready-to-use	1 ml. per 75 lbs. body weight. (300 mcg of ivermectrin per kilogram of body weight)	Inject subcutaneously. Follow label instructions.
HOG LICE		POUR-ON	
18. Fenthion (Tiguvon) OP, ME 3% PO	Ready to use	1/2 fl oz per 100 lbs body weight	Pour evenly along backline. Treat all animals in herd for best results. Tiguvon is a cholinesterase inhibitor. Do not use this product on animals simultaneously or within a few days before or after treatment with or exposure to cholinesterase inhibiting drugs, pesticides or chemicals. Do not treat sick, convalescent or stressed animals. Do not treat within 14 days of slaughter
MANGE MITES			
19. Fenvalerate SP, ME	Use according to instructions given under hog lice control in No. 3 above		
20. Ivermectin ME	Use according to instructions given under hog lice control in No. 18 above.		
21. Lindane CH, ME	Use according to instructions given under hog lice control in No. 4 and No. 10 above except mix 1 ½ lbs. of 25% WP in 100 gals. of water. For most effective treatment apply 2 sprays one week apart.		
22. Malathion OP, LE	Use according to instructions given under hog lice control in No. 5, 11, & 14 above		

Swine

Pest and Product	Dilutions	Application Rate	Remarks
23. Permethrin SP, ME			Use according to instructions given under hog lice control in Nos. 7 & 13 above.
24. Permethrin (Atroban) SY, ME 42.5% EC	0.108% Mix 8 ozs. of 42.5% EC in 25 gals of water.	Spray animals thoroughly (approximately 1 pt./animal).	See No 13 above. Repeat application in 14 days. 5 days from last application until slaughter.
BLOWFLIED, MOSQUITOES, FLEAS AND TICKS			
25. Phosmet (Permethrin II) SP, ME 10% EC	0.025% Mix 1 qt. of 10% EC in 25 gals. of water.	Spray, paint or dip to apply 1 pint per hog, especially around ears.	See No. 7. Five days from last application until slaughter.
26. Phosmet (Del-Phos, Lintox-HD, Prolate) OP, ME			Use according to instructions given under hog lice control in No. 8 above
TICKS			
27. Coumaphos (Co-Ral) OP, ME 25% WP	0.24% Mix 8 lbs. of 25% WP in 100 gals. of water.	Thoroughly wet animal. Repeat as needed but not more often than every 14 days.	See No. 2. 0 days fro last application until slaughter.
WOUND-INFESTING MAGGOTS			
28. Coumaphos OP, ME (Co-Ral) 25% WP	0.24% Mix 8 lbs of 25 % WP /100 gals water	Thoroughly treat wound and surrounding area with light but thorough coverage.	Application instructions and restrictions same as for Co-Ral in No. 2 above. Repeat as needed but not more often than every 14 days. 0 days from treatment to slaughter.

¹ Insecticides recommended for hog lice control will aid in the control of ticks, mange mites and flies on swine.

² When applying insecticides, do not contaminate feed or drinking water.

³ Do not treat animals less than 3 months old with insecticides unless specifically allowed on the insecticide label.

⁴ OP - organophosphate, SP - Pyrethroids, NP - natural pyrethrins, CH - organochlorine, CR - carbamate, LE - less effective or effectiveness not determined, ME - most effective.

⁵ Limit spray applications in winter to warm, calm days when temperatures are above freezing.

⁶ Do not treat sick, convalescent or stressed animals.

Poultry External Parasite Control

IMPORTANT: Effective, economical fly control depends on producer management. Check fly-breeding areas (manure, around feed bins, etc.) Weekly and maintain an integrated pest management program (IPM) to ensure long term fly control.

Poultry

Insecticide ¹	Formulation and Mixing Instructions	Application Instructions	Safety Restrictions ²
BEDBUGS, CHICKEN LICE, FLEAS, FOWL TICKS, and MITES			
For Direct Treatment to Birds or Poultry Facility			
DUSTS ³			
1.	Malathion (Cythion) 4% or 5% Dust, OP	Dust Ready to use	Apply 1 lb/100 birds by direct application to birds or apply 1 lb/50 sq ft of litter and floor space and to nests, roosts, and adjacent areas or apply 1 lb in 18"x12"x3" dust box/30 birds.
2.	Permethrin (Ectiban, Insectrin, Permethrin) 0.25% Dust, PY,	Dust Ready to use	Apply 1 lb/100 birds. Ensure thorough treatment of vent for northern fowl mite control.
3.	Rabon (stirofos, tetrachlorvinphos) 50% WP or 3% Dust, OP	Dust Ready to use	Apply 2.5 ozs (5 Tbs)/100 sq ft of litter or mix 2.5 ozs (5 Tbs)/50 birds evenly throughout contents of top layer in dust boxes. Apply 1 lb of dust/300 birds on wire and 1 lb of dust/100 sq ft of litter for floor birds.
4.	Sevin (carbaryl) 5% or 10% Dust CR	Dust Ready to use	Apply 1 lb/100 birds by direct application. Use 1 lb/40 sq ft on litter, walls, etc. As a supplement to litter treatment, apply 1.5 lbs in dust box/50 birds. On ranges, provide 2 natural wallows containing 2.5 lbs. dust/50 birds. On ranges, provide 2 natural wallows containing 2.5 lbs dust/50 birds. Do not treat nest litter. Do not treat with Sevin more often than once every 28 days. Waiting period between last application and slaughter: 7 days. Do not treat with Sevin more often than once every 28 days. Waiting period between last application and slaughter: 7 days.
SPRAYS ⁴			
5.	Dibrom (naled) 4 lbs ai per gal EC (37%), OP	0.3% spray: Mix 1 cup EC in 10 gals water	Apply 1 gal/100 birds OR apply 1 gal/500 sq ft to infested area in house. Do not treat chickens under 6 weeks or turkeys under 3 months of age. Avoid contamination of eggs, feed or water.

IMPORTANT: Effective, economical fly control depends on producer management. Check fly-breeding areas (manure, around feed bins, etc.) Weekly and maintain an integrated pest management program (IPM) to ensure long term fly control.

Poultry

Insecticide ¹	Formulation and Mixing Instructions	Application Instructions	Safety Restrictions ²
6. Malathion (Cythion) 25% WP or 5 lbs ai per gal EC (57%), OP	0.5% spray: Mix 1.5 lbs WP OR 2/3 cup (2 Tbs/gal) EC in 10 gals water. 1.0% spray: Mix 3 lbs WP OR 1 1/3 cups EC in 10 gals water.	Apply 1 gal/100 birds of 0.5% spray OR apply 1 gal 1.0% spray/1000 sq ft to litter, walls, ceilings, nests, roosts and adjacent areas.	Do not apply 1.0% spray directly to birds.
7. Permethrin (Ectiban, Insectrin, Permaban, Permethrin) 5.7% EC, SP	0.05% spray: Mix 1 qt 5.7% EC OR 1 pt 11% EC in 25 gals water	Apply 1 gal diluted spray to 100 hens using high pressure. Apply to vent area for best results.	One application should provide control. A second application may be needed 4 to 12 weeks later.
8. Rabon (stirofos, tetrachlorvinphos) 50% WP, OP	0.5% spray: Mix 2 lbs WP in 25 gals water.	Apply 1 gal/100 birds. Apply directly to birds. Spray vent and fluff areas from below using high pressure (100 psi and up). For treatment of litter, walls, ceilings, roosts, cracks and crevices, apply 1 to 2 gals per 1000 sq ft.	Repeat as necessary, but not more often than once every 14 days. Spray birds lightly.
9. Ravap (23.0% stirofos + 5.7% dichlorvos) 28.7% EC, OP	0.5% spray: Mix 2 qts EC in 24 gals water.	Apply 1 gal/100 birds. Apply directly to birds. Spray vent and fluff areas from below using high pressure (100 psi and up) sprays. Wet feathers around vent area for effective control. For floor birds, apply 1 to 2 gals of spray per 1000 sq ft of litter.	Do not spray birds more often than once every 14 days. Spray birds lightly.
10. Sevin (carbaryl) 80% SP or 50% WP, CR	0.5% spray: Mix (1/4 lb) 80% SP OR (1/2 lb) 50% WP in 5 gals water.	Apply 1 gal/100 birds. Apply directly to birds.	Do not treat nest litter. Waiting period between application and slaughter: 7 days.
BEDBUGS, CHICKEN MITES, FLEAS and FOWL MITES			
For Treatment of Poultry Facility Only Not For Direct Application to Birds			
11. Dibrom (naled) 4 lbs ai per gal EC (37%), OP	0.3% spray: Mix 1 cup EC in 10 gals water.	Apply 1 gal/500 sq ft to infested areas in house but not directly on birds. Force into cracks.	Do not apply to birds, nests or eggs.
12. Malathion (Cythion) 5 lbs ai per gal EC (57%), OP	3.0% spray: Mix 3/4 cup EC in 1 gal water.	Apply 1 to 2 gals/1000 sq ft. Force into cracks.	Do not apply to birds, nests or eggs.

IMPORTANT: Effective, economical fly control depends on producer management. Check fly-breeding areas (manure, around feed bins, etc.) Weekly and maintain an integrated pest management program (IPM) to ensure long term fly control.

Poultry

Insecticide ¹	Formulation and Mixing Instructions	Application Instructions	Safety Restrictions ²
13. Rabon (stirofos, tetrachlorvinphos) 50% WP OR 2 lbs ai per gal EC (24%)	1.0% spray: Mix 4 lbs WP OR 1 gal EC in 25 gals water.	Apply 1 gal/125 sq ft with high pressure. Force into cracks.	Do not apply to birds, nests, or eggs.
14. Ravap (23%) stirofos, tetrachlorvinphos + (5.7%) dichlorvos 28.7% EC OP	1.25% or 2.5% spray or 1.25% roost paint: Mix 1 gal EC in 12.5 gals of water to make 2.5% mixture or mix 1 gal EC in 25 gals of water to make 1.25% mixture.	Apply roost paint at the rate of 1 pt of finished mixture per 100 ft of roost area with brush or spray OR apply 1 gal of spray per 100-150 sq ft for fowl ticks or 1 gal of spray per 500-1000 sq ft for other parasites.	
15. Sevin (carbaryl) 50% WP OR 80% SP, OP	Mix 5 lbs 80% SP/100 gals of water for chicken mites, fleas and bedbugs; for fowl ticks mix 20 lbs 80% SP/100 gals of water.	Apply 1 to 2 gals spray mixture/1000 sq ft to walls, bedding, litter and roosts.	Repeat as needed. Avoid spraying nests, eggs and feeding and watering troughs. Waiting period between application and slaughter: 7 days.
TURKEY LESION CHIGGERS			
For Treatment of Ranges Only			
16. Malathion 5 lbs ai per gal EC (57%), OP	Apply 1 to 1.5 pints EC/acre.	Apply broadcast on range in enough water (100 to 150 gals/acre) for good coverage.	Apply 1 day before putting turkeys on range. Repeat every 2 to 3 weeks, if needed.
17. Malathion (Cythion) 4% or 5% Dust, OP	25 lbs of 4% dust OR 20 lbs of 5% dust/acre.	Apply broadcast on range.	Apply 1 day before putting turkeys on range. Repeat every 2 to 3 weeks, if needed.
18. Dursban (chlorpyrifos) 50% WP, OP	Apply 8 lbs WP/acre.	Apply broadcast on range in enough water (100 to 150 gals/acre) for good coverage.	Apply just before turkeys are placed on ranges. Dursban can only be applied twice to infested ranges at a four-week interval. Do not spray turkeys, feed or water. Allow at least 3 weeks after application for lesions to heal. Waiting period between application and slaughter: 7 days.
LITTER BEETLES (Darkling beetles, black bugs, black poultry bugs, lesser mealworms)			
19. cyfluthrin (Tempo) 20% WP, SP	Mix 9.5 grams (0.05%) or 19 grams (0.1%) of 20% WP in sufficient water to treat 1000 sq. ft.	Apply as a general surface and/or a crack and crevice spray.	Do not make applications when birds are present. Do not make applications to feed, water and feeding and watering equipment.

IMPORTANT: Effective, economical fly control depends on producer management. Check fly-breeding areas (manure, around feed bins, etc.) Weekly and maintain an integrated pest management program (IPM) to ensure long term fly control.

Poultry

Insecticide ¹	Formulation and Mixing Instructions	Application Instructions	Safety Restrictions ²
20. Rabon (stirofos, tetrachlorvinphos) 50% WP, OP	0.5% spray or 50% WP: Mix 2 lbs WP in 25 gals water or use 50% WP undiluted.	Apply 1 to 2 gals per 1000 sq ft of litter, walls, center posts and foundation walls. Apply undiluted dust using 3/4 oz per 100 sq ft of litter using rotary or mechanical duster.	
21. Safecide (orthoboric acid) 99% dust INO	Dust ready to use when purchased. When making spray mixture, mix 1 to 2 lbs of 100% dust per 3 gals of water.	Apply ready to use dust at 1 to 2 lbs per 100 sq ft after litter and birds have been removed.	Don't treat litter or birds. Reapply as needed between grow outs. Apply spray mixture at 3 gals./ 100 ft ² of side walls, top plates, posts, and framing. Spray into cracks and crevices.
		Apply spray mixture at 3 gals per 100 sq ft of side walls, top plates, posts and framing.	Spray into cracks and crevices.
22. Safecide (orthoboric acid) 30% Bait, INO	Bait ready-to-use when purchased.	Apply bait uniformly to floor of poultry house or to old litter with a fertilizer or seed spreader, at the rate of 1 to 2 lbs per 100 sq ft in bands along feeder lines.	Prior to application, remove birds. Re-introduce birds following treatment. Reapply after each grow out, if needed as outlined above.
23. Sevin (carbaryl) 20% bait, 41.2% water dispersable liquid (Sevin XLR and Sevin FL) and 80% S, CR	Bait is ready to use when purchased. Mix 50 qts of 43.4% water dispersable liquid OR mix 62.5 lbs 80% S in 100 gals of water.	Apply 8 to 12 ozs of 20% bait uniformly per 1000 sq ft of litter surface.	Birds can be present during application. Repeat bait treatment after 5 weeks, if needed. No waiting period between application and slaughter when using bait.
		Apply 1 to 2 gals of spray mixture per 1000 sq ft of litter surface.	Don't apply spray when birds are in houses. Ventilate while spraying. Waiting period between application and slaughter is 7 days when using spray.

¹ Abbreviations used: CR - carbamate; NP - natural pyrethrum; OP - organophosphate; INO - inorganic; SP - synthetic pyrethroid.

² Do not contaminate feed, water or feeding and watering equipment.

³ Dust birds thoroughly, especially under the wings and around the vent. Provide thorough ventilation while dusting.

⁴ Penetration of feathers around vent is essential for northern fowl mite control. Apply directed sprays using 100 to 125 psi. Provide thorough ventilation while spraying. Force sprays into cracks and crevices when treating for chicken red mites, bedbugs, fleas and fowl ticks.

Poultry - Fly Control

Poultry

Insecticide	Spray Concentrations and Mixing Instructions	Application Methods	Safety Restrictions ¹
RESIDUAL AND BAIT SPRAYS			

Residual and bait sprays are used when a residual insecticide deposit is needed for adult fly control. Apply to surfaces in poultry operations where flies rest and feed.

NOTE: Use of residual sprays promotes insecticide resistance. Use of synthetic pyrethroid (SP) insecticides virtually eliminates the implementation of a dump fly (*Hydratea anescens*) biological control program.

1.	Permethrin (Atroban, Ectiban, Insectrin, Permethrin, Permet, Overtime) 5.7% EC, 10% EC or 25% WP, SP, LE	5.7% EC is ready to use as a spray OR mix 1 qt 5.7% EC in 12 1/2 gals of water OR mix 6 ozs 25% WP in 11 gals of water OR mix 1 qt 10% EC in 25 gals of water.	Apply as a residual surface spray to fly resting areas (walls, ceilings, etc.).	Do not spray manure or litter. Do not apply directly to poultry. Do not apply in egg storage areas.
			Apply 5.7% EC undiluted at 4 ozs per 1000 sq ft of surface area or apply diluted WP and EC mixtures at 1 gal/750 sq ft.	Don't apply more than once every 2 weeks.
2.	Rabon (Poultry Spray) 50% WP, OP, LE	1.0% spray: Mix 1 1/2 lbs WP in 10 gals of water (5 Tbs per gal).	Direct spray to inside and outside surfaces of poultry buildings where flies congregate and feed to include floors, manure, walls, ceilings, grass, etc. Apply thoroughly to point of runoff (about 1 gal per 500 to 1000 sq ft). To make bait spray, add 1 cup sugar or syrup per gal of spray.	Do not contaminate eggs, feed or water. Keep spray away from birds.
3.	Ravap (Rabon 2 lbs, ai per gal (21.4%) and Vapona 0.5 lb, ai per gal (5.7%) EC, OP	1.0% spray: Mix 1 gal EC in 25 gals of water (12 Tbs/gal).		Methods of application and safety restrictions same as for Rabon in #2 above.

CONTACT SPRAYS

These sprays are also called space sprays and are only effective for very short periods. They kill flies directly contacted by the spray. Several types of mist, aerosol and ULV (ultra-low volume) equipment are sold for applying these sprays. Be sure that insecticides bear full label instructions for use in poultry houses to avoid violation of Federal and State laws.

4.	Dibrom (naled) 4 lbs ai per gal EC (37%) OP, LE	0.3% EC spray: Mix 1 cup EC in 10 gals of water.	Apply as a light mist spray when adult flies are present. Direct space spray throughout fly infested areas.	Do not apply directly to birds. Do not contaminate eggs, feed or water.
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Poultry

Insecticide	Spray Concentrations and Mixing Instructions	Application Methods	Safety Restrictions ¹
5. Pyrethrins (0.3 - 5.0%) plus Piperonyl Butoxide (1.5 - 25%) NP, ME	Ready to use, dilute oil sprays. Aerosols, ULV concentrates, and concentrates for dilution are available.		Apply fog or mist sprays when adult flies are present to obtain temporary adult fly suppression. Advantage is safety when used around animals and food products. Pyrethrin knockdown sprays are essential for emergency fly control. Aerosol, dilute mist or ULV cold fog equipment should be available for use when needed.
6. Vapona or DDVP (dichlorvos) 2 lbs ai per gal EC (21.8%) OP, LE	0.5% spray: Mix 3 1/3 cups EC in 10 gals of water.	Apply as a light mist spray when adult flies are present. Direct space spray throughout fly infested area.	Do not apply directly to birds. Do not contaminate eggs, feed or water.
LARVICIDE (Maggot) SPRAYS and FEED THROUGH LARVICIDES			
Another way to control flies is to destroy the immature or maggot fly. Heavy use of a given insecticide could result in flies developing a resistance to the insecticide. To kill adult flies, use fly traps and apply baits, residual sprays, bait sprays and contact sprays either alone or in combination.			
7. Cygon (dimethoate) 2 lbs ai per gal EC (23.4%) OP, ME	1% spray: Mix 6 2/3 cups EC in 10 gals of water.	Under cages, use about 1 gal/25-100 sq ft of manure applied broadcast as a coarse, low-pressure spray. Apply at 7-10 day intervals along with an intensive adult house fly control program until manure begins to dry or cone up. Spot spraying of manure and continued use of adult house fly control will maintain control.	Do not contaminate eggs, feed or water. Keep spray away from birds.
8. Larvadex (Cyromazine) 1% Premix, HE	5 parts per million in total diet of commercial layers or hatching egg layers. Mix 1 lb of 1.0% premix per 2000 lbs of feed.	Feed treated feed as daily ration as needed to control house flies and soldier flies.	The high rate of Larvadex will kill dump fly (<i>Hydratea anescens</i>) in the pits thus destroying this biological fly control agent. If attempting biological fly control, producers will need to use Larvadex based on a sound and carefully managed IPM program. Treated feed must not be fed to layers for a minimum of 3 days (72 hours) before slaughter for food.
9. Larvadex (Cyromazine) 2% Liquid Larvacide, LE	Mix 64 fl ozs of the 2% liquid in 10 gals of water.	Apply 1 gal of 0.1% spray per 100 sq ft of area where fly larvae are present.	Do not apply more frequently than once every 21 days. Do not apply to poultry or poultry feed. Allow 1 day (24 hours) between application and slaughter. Before applying treated manure to soils and crops, read the Larvadex 2SL label carefully to avoid illegal residues or crop damage.

Poultry

Insecticide	Spray Concentrations and Mixing Instructions	Application Methods	Safety Restrictions ¹
10. Rabon (Poultry Spray) 50% WP OR 2 lbs ai per gal EC (24%) OP, LE	1% spray: Mix 3 1/4 cups 50% WP OR 7 1/2 cups 24% EC in 10 gals of water.	Apply 1 gal per 25-100 sq ft of manure.	Observe same methods of application and safety restrictions as for Cygon in #7 above.
11. Ravap (Rabon 2 lbs ai per gal 21.4% and Vapona 0.5 lb ai per gal 5.7%) EC, OP, ME	1% spray: Mix 6 1/2 cups EC in 10 gals of water.	Apply 1 gal per 25-100 sq ft of manure.	Observe same methods of application and safety restrictions as for Cygon in #7 above.
12. Vapona or DDVP (dichlorvos) 2 lbs ai per gal (21.8%) EC, OP, ME	0.5% spray: Mix 3 1/3 cups EC in 10 gals of water.	Apply enough spray to penetrate manure (until thoroughly wet).	Since Vapona has such a short residual, heavy treatment is required for larval kill. Once control is established, Vapona is an economical spot spray. Observe same methods of application and safety restrictions as for Cygon in #7 above.

DRY BAITS

In some operations, dry baits can be used to control adult house flies. These materials can be bought ready to use.

13. methomyl (Apache, Golden Malrin, Improved Golden Malrin) 1% bait, CR, ME	Ready to use bait.	Scatter on floors, walkways, etc., throughout house. Apply heavy (about 1/2 - 2 lbs/1000 sq ft) until flies are suppressed.	Wear rubber gloves when applying baits. Do not allow workers on treated floors without shoes. Keep pets out of house. Do not contaminate eggs, feed or water. Keep baits away from birds.
14. Nithiazine (Quick Strike) 1.0% fly abatement strips	Ready-to-use strip	Hant one strip per 100 ft. ² or 300 ft. ² depending on fly population in enclosed areas that are protected from rain.	
15. trichlorton (Sugarcide) 1% bait, OP, LE	Ready to use as a dry bait. As a liquid bait: Mix 4 ozs in 1 gal of water, and add 2 cups of corn syrup or 1 lb of sugar and stir until dissolved.	As a dry bait: Apply and follow precautions as for methomyl (#12) above. As a liquid bait: Sprinkle the solution in a 4-10 inch wide band or apply the solution to burlap bags or squares of hard surface material and place on floors, window sills of farm buildings and outside buildings when fly population is intense.	

¹ Do not contaminate feed, water or feeding and watering equipment. OP - organophosphate, CR - carbamate, SP - synthetic pyrethroid, NP - natural pyrethrin, LE - less effective or effectiveness not determined, ME - most effective.

Horses -- External Parasite Control

Horse

External Parasites	Insecticide ¹	Formulation & Mixing Instructions	Application Instructions & Use Restrictions
FLIES: Biting midges, Black flies, Deer flies, Face flies, Gnats, Horn flies, Horse flies, Lice, Mosquitoes, Punkies, Ticks, Wound infesting larvae (screwworms)	coumaphos (Co-Ral) OP, LE 11.6% EC (Restricted Use). 5.8% EC and 25.0% WP	Fly, Lice and Tick Control: 0.06% to 0.125% WP or EC spray. Mix 1 or 2 lbs 25% WP in 50 gals water OR 2½ - 5 ozs 11.6% EC in 4 gals water OR mix 5 fto 10 oz. Of 5.8% EC in 4 gals. of water	Spray: Apply higher concentrations for ticks. Treat wounds for wound-infesting larvae. Treat animal thoroughly. Do not treat animals less than 3 months old. Do not treat sick, convalescent or stressed horses or those that have been treated with other drugs. Do not treat horses intended for slaughter.
	cypermethrin SP, ME 0.15% (Bite Free, Tri-Tec 14)	Fly Control: Ready-to-mix	Mist spray or wipe-on: Apply mist spray to horses as needed every 5 to 14 days. Not for use on horses intended for human consumption.
	fenvalerate 8.0% Collar/Brow Band (Ectrin, Fly Guard) SP, LE	Fly Control: Ready-to-use	Collar/Brow band: Apply one per animal when flies reach damaging levels. Remove when control begins to drop off and during cooler months of the year. Due to fly resistance problems, don't reapply except during alternate years.
	fenvalerate 10% WDL (Ectrin) SP, ME	Fly Control: 0.12% spray. Mix 1 qt of 10% WDL in 25 gals of water OR mix 2 ozs of 10% WDL in 1.5 gals of water	Mist spray: Apply 8 ozs as light spray with attention to head and legs. Repeat as needed. Do not treat animals intended for slaughter.
	lindane 25% WP (Restricted Use) CH, ME	Fly, lice and tick control: Mix 1 lb. Of 25% WP in 100 gals. of water, or 1 oz. In 6 gals. of water	Spray: Apply up to 2 qts. Diluted spray per animal. Use proportionately lesser amounts for smaller animals. Do not treat animals under 3 months of age. Avoid treating animals in cold, stormy weather. Do not spray thirsty, overheated or sick animals. Read label carefully and follow label directions. Do not treat animals intended for slaughter.
	malathion 57% EC (Cythion) OP, LE	Fly Control: 0.5% or 0.6% spray. Mix 1 gal of 57% EC in 100 gals of water.	Spray animals thoroughly. Apply about 2 qts of spray per mature animal. Apply every 3 weeks, if needed. Do not treat animals under 1 month old. No waiting period between application and slaughter.
		Fly Control: 4% or 5% dust - Ready-to-use - No mixing required	Dust: Apply 1 to 1.5 ozs per animal. Repeat, if needed, every 10 to 14 days. No waiting period between application and slaughter.
	methoxychlor 5.0% EC (Purina Horse Spray Concentrate Insecticide) CH, LE	Fly Control: Mix 1 pt of 5.0% EC in water to make 1 gal of mixture	Sponge-on: Apply 1 pt to 1 qt per animal to infested areas (ears, neck, back - but not under the saddle, belly and legs). Treat as needed to maintain control. No waiting period between application and slaughter.
Fly and Lice Control: Mix 1 qt of 5.0% EC in 9 qts of water		Spray: Spray entire animal until hair is wet to the skin. Apply 1 pt to 1 qt per animal. Treat as needed to maintain control. For lice, retreat in 10 days. No waiting period between application and slaughter.	

Horse

External Parasites	Insecticide ¹	Formulation & Mixing Instructions	Application Instructions & Use Restrictions
FLIES: (cont'd)	methoxychlor 0.5% + butoxypolypropylene-glycol 10.0% + pyrethrins 0.05% + synergist (Buzz Off, Horse spray and Rub-on) CH + R + NP, LE	Kills and repels flies: Ready-to-use - No mixing required	Spray and wipe-on: Apply up to 2 ozs per day. Do not spray feed or water.
	methoxychlor 5.0% + butoxypolypropylene-glycol 50.0% concentrate (Purina Horse spray) CH, LE	Kills and repels flies and lice: Sponging, mix 1 pt concentrate in 7 pts of water. Spraying, mix 1 qt concentrate in 9 qts of water.	Sponge on: Treat haircoat in the region of the ears, neck, back (not under saddles) and legs. Spraying: Spray entire animal to dampen haircoat or wet the skin. Apply 1 pt to 1 qt per animal.
	permethrin 5.7% EC (Insectrin, Insectaban, Overkill) SP, ME	Fly, mange, tick and lice control: Mix 1 pt of 5.7% EC in 12.5 gals of water	Spray: 1 to 2 qts per animal over whole body surface. For mange, lice, and scabies control, thoroughly soak animal and apply a second treatment 14 days later. No waiting period between application and slaughter.
		Lice control: Mix 1 pt of 5.7% EC in 25 gals of water	Spray: until animal is thoroughly treated. A second application is recommended 14 days later. No waiting period between application and slaughter.
		Fly and ear tick control: Mix 1 pt of 5.7% EC in 1.25 gals of water	Spray mist: Apply 1 to 2 ozs per animal. Spot treat back, face, legs and ear. Do not use on horses intended for human consumption.
	permethrin 10.0% to 11.0% EC (Atroban, Overkill, Permectrin II) SP, ME	Fly and lice control: Mix 1 pt of EC in 25 or 50 gals water (1 oz in 6 qts of water)	Spray: Use high concentrations for stable flies and face flies. Apply directly to animals at 1 qt to 2 qts per animal. Light rates are for horn fly control only. Repeat as needed but not more often than once every 2 weeks. Do not contaminate feed or water.
	permethrin 0.25% Dust (Horse Lice Duster III) SP, ME	Fly and lice control: Ready-to-use dust	Dust: Apply 2 ozs of dust per animal by shaker can over the head, neck, shoulders, back and tailhead. Repeat as necessary.
	permethrin 0.4% to 1.0% ready-to-use spray or wipe-on (Buzz Off II, Expar, Hard Hitter, Hunter, Tech-Trol), SP, ME	Fly, lice and tick control: ready-to-use when purchased. No mixing required	Spray or wipe-on: Apply as needed. Do not soak hair or skin. Pay particular attention to legs, shoulders and neck. Do not get in animal's eyes. Do not treat horses intended for human consumption.
permethrin 1.84% Pour-on (Poridon Insecticide Pour-on) SP, LE	Aids in fly control: Ready-to-use when purchased. No mixing required	Pour-on: Apply 2 to 4 ozs per animal. Start by pouring a line bead from the poll, along the neck, and continue posteriorly down the back parallel with the spinal column or apply as a wipe-on.	
permethrin 25% WP (Permectrin) SP, ME	Fly, lice, tick & mite control: Mix 6 ozs (21 level Tbs) of 25% WP in 19 gals of water	Spray: Spray to run off or use 1 gal spray mix per head. Do not spray feed or water.	

Horse

External Parasites	Insecticide ¹	Formulation & Mixing Instructions	Application Instructions & Use Restrictions
FLIES: (cont'd)	permethrin 40% EC (Gardstar) SP, ME	Fly, mite, tick and lice control: Mix 7.5 ml in 1 pt. of water (0.64%)	Spray: Apply as a low pressure spray. Apply 1-2 fl. Oz. (30-60 ml) spray per animal. Spot treat back, face legs, tail ;and ears.
		Fly, mite, tick and lice control: Mix 5-12.5 ml in 2 gal. of water (0.026-0.067%)	Dip wash: Thoroughly wet animal to skin with sponge or rag. Let drip dry. Do not wet the animal's face.
	pyrethrins + synergist NP, LE	Fly control: 0.05% to 0.2% plus synergist mist spray - Ready-to-use - No mixing required	Spray or wipe-on: Apply mist spray or wipe-on to wet the ends of the hair but not enough to wet the hide (1 to 4 fl ozs per animal). Direct application will kill ticks. Repeat as needed.
	pyrethrins 0.4% + synergist EC (Repel-X) NP, LE	Fly and tick control: Mix 1 pt of 0.4% EC in enough water to make 1 gal of mixture. For horse flies, deer flies (Tabanids), stable flies and ticks, mix 1 pt of 0.4% EC in 2 qts of water	Spray or sponge-on: Apply heavily to wet animal every 3 to 4 days or as needed to control flies and ticks. Do not use on animals intended for human consumption. Avoid getting into animal's eyes.
	pyrethrins 0.36% + synergist spray (Swat) NP, LE pyrethrins 0.05% + synergist 0.5% + permethrin 0.1% to 0.5% ready-to-use spray (Flycycle 2, Repel-X) NP+SP, LE	Fly, lice, tick and flea control: Ready-to-use when purchased. No mixing required	Spray or wipe-on: Apply to wet hair but not skin of animal. Remove excess dirt and dust before treating. Repeat as needed. Do not treat horses intended for human consumption.
	Pyrethrins 0.1% + synergist spray and Wipe-on (Wipe II) NP, LE	Fly, gnat and mosquito control: Ready-to-use when purchased. No mixing required.	Spray or wipe-on: Apply to wet hair but not the skin. Remove excess dirt and dust before treating. Repeat as needed.
	pyrethrins 0.2% + synergist wipe-on (Wipe) NP, LE	Fly gnat and mosquito control: Ready-to-use when purchased. No mixing required.	Wipe-on: Apply as a wipe-on to wet hair but not the skin. Remove excess dust and dirt before treating. Repeat as needed.
	pyrethrins 0.2% + synertist ointment (Swat) NP, LE	Fly repellent/control: Ready-to-use when purchased. No mixing required	Ointment: To treat superficial wounds, abrasions, sores and scratches, apply enough ointment to cover the wound. Apply directly to the wound and use daily.
	resmethrin 0.5% + butoxypolypropylene-glycol 10.0% (Super Shield II) SP + R, LE	Fly control: Ready-to-use - No mixing required	Spray or wipe-on: Apply to wet hair but not the skin of animal. For maximum protection apply 4 to 6 ozs to animal and repeat every 2 to 3 days if needed. Do not use on horses intended for slaughter.

Horse

External Parasites	Insecticide ¹	Formulation & Mixing Instructions	Application Instructions & Use Restrictions
FLIES: (cont'd)	resmethrin 0.554% + butoxypolypropylene-glycol 11.0% (Fly Repellent) SP + R, LE	Fly and tick control: Apply by spray or wipe-on - Mix 4 ozs of concentrate in 28 ozs of water to make 1 qt	As a wipe-on: Dampen a soft cloth and rub over hair after cleaning debris from animal. Apply spray mist to horse's coat. Pay particular attention to legs, shoulders, and neck while avoiding eyes. Do not use on horses intended for slaughter.
	tetrachlorvinphos (Rabon) OP + pyrethrins (NP) + synergist (Flycycle 1, Purina Fly Screen) LE	Fly control: Available in ready-to-use gels, wipe-ons, aerosol sprays, and dust formulations - Primarily for temporary relief	Prior to application, brush dirt and dust away from the hair coat. Treat areas that need protection. Apply up to 1 to 2 fl ozs per animal. Do not wet the skin of the animal - only the hair should be treated. Apply as needed for protection. No waiting period between application and slaughter.
	tetrachlorvinphos 0.475% to 2.468% Horse Feed Supplement (Rabon, Equitrol, Vita-Plus with Equitrol, Drive with Equitrol) OP, LE	Manure breeding flies: Ready-to-use feed supplement - each horse must consume 70 mg tetrachlorvinphos per 100 lbs of body weight daily	Feed additive: Follow feeding instructions on the label. Each horse must consume sufficient quantities if adequate control is to be achieved. Do not feed to horses intended for slaughter. This product must be supplemented with other fly control products.
MANGE: Sarcoptic or Psoroptic	lindane (restricted use) CH, ME	0.03% to 0.05% spray or dip. Mix 1/4 to 3/4 lb of 25% WP in 50 gals of water	For best results, dip or treat animals with 2 qts spray. Retreat after 7 days. Do not treat sick or otherwise weakened animals. The waiting period between application and slaughter is 60 days.
	malathion OP, LE	When applied as for flies, will provide marginal control if great care is taken to thoroughly treat infested areas.	
	permethrin 5.7% EC (Purina Hard Hitter, Stable Spray, Insectrin, Insectaban) SP, LE	Fly, mange, tick and lice control: Mix 1 pt of 5.7% EC in 12.5 gals of water	Spray: 1 to 2 qts per animal over whole body surface. For mange, lice and scabies control, thoroughly soak animal and apply a second treatment 14 days later. No waiting period between application and slaughter.
BOTS	dichlorvos (Equiguard, Horse Wormer) OP, ME	17.5% PVC pellets 1 packet (19.5 grams) per 300 lbs of animal body weight	Give to individual horses in half the grain portion at a single feeding to ensure maximum bot removal. Withhold water 4 to 6 hours before and 3 hours after consumption of drug. Do not treat sick animals. Do not give with or within 1 week of the administration of tranquilizing drugs or other internal parasite drugs. Do not treat horses intended for human consumption. Veterinary consultation is recommended.
	ivermectin (Eqvalan, Zimecterin) ME	1.87% oral paste - Ready-to-use when purchased - No mixing required	Follow directions on pre-filled syringe. Do not treat horses less than 4 months of age. Do not treat horses intended for food purposes.

Horse

External Parasites	Insecticide ¹	Formulation & Mixing Instructions	Application Instructions & Use Restrictions
BOTS (cont'd)	trichlorfon (Combot Liquid, Combot Paste) OP, ME	<p>40% oral paste - Administer 16 mg/lb of trichlorfon / lb. Of body weight orally.</p> <p>12.3% liquid - Ready-to-use when purchased - No mixing required. Administer ½ ounce Combot Liquid per 1200 lbs. of body weight.</p>	<p>Treat 30 days following first killing frost. Repeat after 3 to 4 months, but never more frequently than every 30 days. Do not treat sick animals, horses to be used for food, colts less than 4 months of age or mares in the last month of pregnancy. Do not give horses intravenous anesthetics, especially muscle relaxants, within 2 weeks of treatment. Be sure to follow label directions carefully. Consult with veterinarian.</p>

¹ OP -- organophosphate, SP -- synthetic pyrethroid, CH -- chlorinated hydrocarbons, NP -- natural pyrethrin, CR -- carbamate, LE -- less effective or effectiveness not determined, ME -- more effective, R -- repellent

Fly Control In Horse Facilities - Residual (Contact) or Bait Sprays ^{1,2}

Horse

Insecticide	Spray Concentration/ Mixing Instructions	Methods of Application & Safety Regulations
cyfluthrin (Countdown) 24.3% EC, 20.0% WP SP, ME	Mix 9.5 grams or 19 grams of 20.0% WP OR mix 16 ml of 24.3% EC in sufficient water to cover 1000 ft. ²	Direct a coarse, wetting spray to surfaces in horse operations where flies congregate to include ceilings, walls, fences, posts and manure. Apply to point of runoff (1 gal. per 500 to 1000 ft.2). Do not contaminate feed or drinking water. Do not apply as a space spray. Do not apply directly to animals. Repeat as needed. For baited solutions add 1 lb. of sugar per gal. of spray. Remove animals before spraying and return them when spray dries.
dimethoate (Cygon) 2 lbs (23.4%) a.i. per gal EC, OP, ME	1% spray. Mix 1 gal of 2 lbs per gal EC in 25 gals water	Direct a coarse, wetting spray to surfaces in horse operations where flies congregate, to include ceilings, walls, fences, posts, floor and manure. Apply to point of runoff (1 gal per 500 to 1,000 sq ft). Do not contaminate feed or drinking water. Do not apply as a space spray. Repeat as needed. Do not apply directly to animals. Remove animals before spraying and return them after spray dries.
fenvalerate (Ectrin) 10% WDL SP, ME	Mix 1 qt of 10% WDL in 10 or 25 gals of water (longer residual results from higher concentrations)	For spraying horse barns. Spray to point of runoff (approximately 1 gal of finished spray per 500 to 1,000 feet.) Repeat in 14-30 days, if needed. Spray ceilings, walls and walkways. Do not treat horse barns of horses intended for slaughter.
malathion (Cythion) 5 lbs a.i. per gal premium grade 57% EC, OP, LE	Mix 1 qt EC in 12 gals water	Same as methods of application and safety restrictions for dimethoate above. Remove all animals less than 1 month of age before treating.
methoxychlor 2 lbs a.i. per gal (25%) EC or 50% WP CH, LE	2.5% to 5% spray. Mix 1 gal EC or 4 lbs WP in 10 gals water	Same as methods of application and safety restrictions for dimethoate above. Remove animals before spraying. When spray dries, animals can be returned.
permethrin (Atroban, Ectiban, Insectrin, Overkill, Permaban, Permethrin) 5.7% EC, 11% EC or 25% WP SP, ME	5.7% EC is ready-to-use as a mist spray OR mix 1 qt 5.7% EC in 12½ gals water OR mix 6 ozs 25% WP in 11 gals water OR mix 1 pt 11% EC in 10 gals water	Apply as a residual surface spray to fly resting areas. Do not spray manure or litter. Do not apply directly to horses. Apply 5.7% EC undiluted at 4 ozs. per 1,000 sq ft of surface area or apply diluted WP and EC mixtures at 1 gal/750 sq ft. Do not apply more often than once every two weeks.
tetrachlorvinphos, stirofos (Rabon) 50% WP, OP, LE	1% or 2% spray. Mix 4 or 8 lbs WP in 25 gals water	Same as methods of application and safety restrictions for dimethoate above.
tetrachlorvinphos, stirofos (Rabon) 2 lbs a.i. per gal (23%) + dichlorvos (Vapona) 0.5 lb a.i. per gal (Ravap) (5.7%) EC, OP, ME	1.25% to 2.5% spray. Mix 1 gal or 2 gals EC in 25 gals water	Same as methods application and safety restrictions for dimethoate above.

¹ Residual spray can be applied as spot sprays to control maggots in manure accumulations.

² ME - more effective, LE - less effective or effectiveness not established, OP - organophosphate, CR - carbamate, SP - synthetic pyrethroid, NP - natural pyrethrum, CH - organochlorine, chlorinated hydrocarbon

Fly Control in Horse Facilities - Space Sprays (Fogs or Mists) and Baits¹

Horse

Insecticide	Spray Concentration/ Mixing Instructions	Methods of Application & Safety Precautions
Space sprays², fogs or mists		
dichlorvos (Vapona or DDVP) 1% Ready-to-use Animal Spray Solution (Stable & Horse Fly Spray) OR 2 lbs a.i. per gal (23.4%) EC OP, LE	0.5% or 1% Ready-to-use fogging solution or mix 1 pt EC in 3 gals or 6 gals water	Apply 1 pt of 1% solution or 1 qt of 0.5% solution per 8,000 cu ft as a fog or mist. Repeated applications will provide adult fly suppression. Do not use more often than once every 24 hours. Do not use if animals have been treated with other insecticides within 8 hours. Do not apply directly to animals. Close all doors and windows when fogging. Do not contaminate feed or water.
naled (Dibrom) 1% Ready-to- use spray OP, LE	1% Ready-to-use	Apply 1 fl oz per 3,000 cubic feet as fine atomized spray. Safety restrictions same as for dichlorvos above.
permethrin 5.7% EC SP, ME	Mix 1 pt of 5.7% EC in 6.25 gals diesel or mineral oil	Apply fog at 4 fl ozs per 1,000 cubic feet of air space in confined facility. Repeat as needed.
Pyrethrin (0.1 to 0.75%) + Synergist (0.5 to 3.75%) NP, ME	Ready-to-use	Apply fogs or spray mists at 1 fl oz per 1,000 cubic feet as fine atomized spray. Repeat as needed.
Baits		
methomyl 1.0% Fly Bait (Apache, Blue Streak, Golden Malrin, Purina Tailspin Fly Bait) CR, ME	Ready-to-use	Scatter on floors, walkways, etc., throughout operation but away from animals. Apply lightly (about 1/4 lb per 500 to 1000 sq ft) until flies are suppressed. Wear rubber gloves when applying baits. Do not allow workers on treated floors without shoes. Do not allow animals to come in contact with baits.
trichlorfon (Sugarcide) OP, LE	Ready-to-use	Apply and follow precautions as for methomyl above.

¹ ME - Most effective, LE - less effective or effectiveness not established; OP - organophosphate; CR - carbamate; SP - synthetic pyrethroid, NP = natural pyrethrum; CH - organochlorine, chlorinated hydrocarbon.

² Space sprays are designed to kill adult flies that are present when the fog or mist is applied. There is little or no residual insecticide deposit remaining after the application unless synthetic pyrethroids are applied. Fogs or mists must come in contact with the fly. These materials are especially effective in enclosed areas where air movement is minimal. Heavy mists can offer some adult house fly kill in open areas.

Sheep and Goats -- External Parasite Control ¹

Sheep and Goats

Insecticide and Formulation	Final Strength in Water and Method of Application	Mixing Instructions Amount Insecticide Mixture to Add to Water	Amount Per Mature Animal	Days From Last Application Until Slaughter	Application Instructions and Restrictions
Lice, Horn Flies, House Flies and Stable Flies					
1. Co-Ral (coumaphos OP) 25% WP	0.06% WP spray or dip	Mix 2 lbs 25% WP in 100 gals water	Wet to point of runoff or immerse	15	Do not treat lactating dairy goats for 14 days before freshening. Treat as necessary to maintain control. Be sure animals have free access to drinking water before dipping. Do not dip excessively thirsty animals. Do not apply to sick, convalescent or stressed livestock or to animals less than 3 months old. Do not spray animals for 10 days before or after shipping, weaning or exposure to contagious and infectious diseases. Do not dip overheated animals. Do not apply in conjunction with oral drenches, other internal medications or insecticides.
2. Malathion* (Cythion) OP 57% EC 25% WP	0.05% EC Spray or dip	Mix 16 lb of 25% WP OR mix 1 gal of 57% EC in 100 gals of water	Wet to point of runoff or immerse entire animal.	0	Do not use on emaciated animals. Repeat application after 2 or 3 weeks if needed. Do not treat milk goats. Do not treat animals under 1 month of age.
3. Methoxychlor * OCL 50% WP	0.5% WP spray or dip	Mix 8 lb of 50% WP in 100 gals of water.	Wet to point of runoff or immerse entire animal.	0	Repeat application after 2 or 3 weeks, if needed. Do not treat milk goats.
4. Permethrin* Gardstar 40% EC) PY	0.013-0.05%	High pressure spray Mix 30-118ml in 25 gals of water	Apply 1 to 2 qts of coarse spray per animal over the entire body.	0	Repeat application 8n 10-14 days for mites and lice. See No. 1.
		0.5% low pressure spray (hand pump sprayer) Mix 118 ml in 2.5 gals of water.	Apply 1.5 fl. oz. of spray to midline from fact to tailhead to point of runoff, but do not let runoff occur.	0	See No. 1.

Sheep and Goats

Insecticide and Formulation	Final Strength in Water and Method of Application	Mixing Instructions Amount Insecticide Mixture to Add to Water	Amount Per Mature Animal	Days From Last Application Until Slaughter	Application Instructions and Restrictions
5. Permethrin* (Atroban 11% Permethrin II 10%) PY	0.05% spray	Mix 1 pt. of 11% EC in 25 gals. of water OR mix 8 ozs. of 10% EC in 25 gals. of water	Apply 1 to 2 qts. of coarse spray per animal to thoroughly wet the animal.	0	Repeat the application in 10-14 days for mites.
6. Permethrin* (Atroban 42.5% EC) PY	0.054% spray	Mix 1 pt. of 42.5% EC in 100 gals. of water.	Apply sufficient spray (Approximately 2 qts./animal to thoroughly wet animals to ensure complete coverage.	0	Repeat the application as needed but not more often than once every two weeks.
Lice, Ticks, Sheep Keds and Fleeceworms					
7. Co-Ral* OP 25% WP	0.12% EC spray or dip	Mix 4 lb of 25% WP in 100 gals of water	Wet to point of runoff or immerse entire animal.	15	Same as for Co-Ral listed in No. 2 above.
8. Fenvalerate (Ectrin) PY	Use according to instructions and safety restrictions given under lice control in No. 2				
9. Malathion* OP	Use according to instructions and safety restrictions given under lice control in No. 3				
10. Permethrin* Gardstar, OP	See No. 5 above.				
Wound-Infesting Maggots					

Sheep and Goats

Insecticide and Formulation	Final Strength in Water and Method of Application	Mixing Instructions Amount Insecticide Mixture to Add to Water	Amount Per Mature Animal	Days From Last Application Until Slaughter	Application Instructions and Restrictions
11. Co-Ral (coumaphos) OP 25% WP 5% D 3% Foam	0.25% WP Spray or dip	Mix 8 lb of 25% WP in 100 gals of water	Treat all wounds and injuries thoroughly.	15	Same as for Co-Ral in No. 1.
SHEEP "TICKS" (KEDS), AND LICE ON SHEEP					
12. Diazinon* (Dryzon) OP 50% WP	0.06% to 0.12% SP spray or sprinkle	<p><u>For use as a high gallonage, high pressure spray:</u> Mix 1/2 lb WP in 100 gals of water and apply at the rate of 1 gal per animal.</p> <p><u>For use as a low gallonage, low pressures spray:</u> Mix 1 lb WP in 100 gals of water and apply at the rate of 1 qt per animal</p> <p><u>For use by sprinkler can:</u> Mix 1 oz WP in 6 gals of water. Crowd sheep into a small pen and sprinkle 1 quart of this mixture over the head, neck, top and side of each sheep.</p>		14	Repeat applications as necessary. Stir or agitate spray mixtures frequently. Do not treat goats.

Sheep and Goats

Insecticide and Formulation	Final Strength in Water and Method of Application	Mixing Instructions Amount Insecticide Mixture to Add to Water	Amount Per Mature Animal	Days From Last Application Until Slaughter	Application Instructions and Restrictions
13. Permethrin* (Atroban, Delice, Expar, Permethrin, Synergized Delice) PY 1% Solution	No mixing required. Ready-to-use when purchased.	Pour along back. Apply 0.25 fl oz (7.5 cc) per 50 lbs body weight of animal, up to a max. of 3 fl ozs for any one animal.		0	Do not treat goats. For optimum control all animals in the flock should be treated after shearing. Repeat treatment as needed, but not more often than once every 14 days. For optimum control, two treatments at a 14-day interval are recommended.
14. Permethrin* (Gardstar) PY	See No. 5 above.				
15. Permethrin* (Boss) 5% PY	No mixing required. Ready-to-use when purchased. Pour-on	Pour-on. No mixing required	Pour slong the back. Apply 1.5 ml per 50 lbs of body weight of animal up to a maximum of 18 ml for any one animal.	0	Reeat treated as needed, but not more often than once every two (2) weeks. For optimum lice control, two (2) treatments at 14 day intervals are recommended.

¹ - Do not treat sick, convalescent or stressed animals. Do not spray in a confined, non-ventilated area.

* - Do not apply to milk goats.

Pesticide Key:

OP - organophosphate
 OCL - organochlorine
 PY - pyrethroid

Precautionary Statement

To protect people and the environment, pesticides should be used safely.

This is everyone's responsibility, especially the user.

Read and follow label directions carefully before you mix, apply store or dispose of a pesticide.

According to laws regulating pesticides, they must be used only as directed by the label.

Persons who do not obey the law will be subject to penalties.

Disclaimer Statement

Pesticides recommended in this publication were registered for the prescribed uses when printed. Pesticide regulations are continuously reviewed.

Should registration or a recommended pesticide be canceled,

it would no longer be recommended by The University of Tennessee.

Use of trade or brand names in this publication is for clarity and information; it does not imply approval of the product to the exclusion of others that may be of similar, suitable composition, nor does it guarantee or warrant the standard of the product.

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COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS

The University of Tennessee Institute of Agriculture, U.S. Department of Agriculture,
and county governments cooperating in furtherance of Acts of May 8 and June 30, 1914.

Agricultural Extension Service Charles L. Norman, Dean