

Protecting Honey Bees

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The poisoning of honey bees and other beneficial insects by pesticides can be a serious problem. Honey bees provide a valuable service to agriculture because they are the most important pollinators of cultivated crops. They also produce honey and beeswax. Efforts should be made to protect honey bees whenever pesticides are used.

Causes of Bee Poisoning

1. Most bee poisoning occurs when insecticides are applied to crops in bloom. This includes crop plants such as sweet corn, which is routinely sprayed when in tassel. Honey bees collect pollen from corn tassels.
2. The application of insecticides to fields with weeds that are in bloom. The spring application of insecticides to alfalfa fields with flowering weeds is a particular problem in Virginia.
3. Drift of toxic sprays or dusts onto adjoining crops or weeds that are in bloom.
4. The contamination of flowering ground-cover crops in orchards when spray applications are made.
5. The contamination of water. This includes water collected by bees for drinking and cooling the hive as well as contact with contaminated water or dew on foliage or flowers.

The most serious problems occur when bees collect contaminated pollen or nectar and carry these materials back to the hive. Insecticidal dusts (particularly Sevin) and encapsulated insecticides are especially dangerous because they adhere to foraging bees and may be collected and stored in the hive with pollen. Such materials can cause serious bee kills within the hive for many months.

Ways to Reduce Bee Poisoning

1. When using pesticides that are hazardous to bees, notify the beekeeper so that he may move or protect his hives.
2. Do not apply insecticides that are toxic to bees to crops in bloom.
3. Use insecticides that are less toxic to bees when such choices are consistent with pest control recommendations (see the table of relative toxicities).
4. Choose the least hazardous formulations when possible. Dusts and encapsulated insecticides are more toxic than sprays of the same material. Wettable powder sprays tend to have a longer residual effect (and are more toxic) than emulsifiable concentrate sprays. Granular applications are usually the safest method of treatment around bees.
5. Avoid drift of toxic sprays onto ground-cover plants, weeds, and crops in nearby fields.
6. Control weeds in fields and avoid direct insecticide applications to flowering weeds whenever possible.
7. If ground-cover plants in orchards are in bloom, mow before spraying.
8. Apply insecticides when bees are not actively foraging, either in the late evening or early morning. This is particularly important with crops such as corn where evening applications avoid many problems since pollen release occurs in the morning. In general, evening applications are least hazardous.
9. Avoid direct treatment over colonies.

Relative Toxicity of Pesticides to Honey Bees by Laboratory and Field Tests

Group I. Highly Toxic

Severe losses may be expected if these pesticides are used when bees are present at treatment time or within a day **thereafter**.

Abamectin	Baygon	DDVP	Gardona	Orthene	Spectracide
Acramite	(propoxur)	(dichlorvos)	(tetrachlorvinphos)	(acephate)	Steward
(bifenazate)	Baytex	Dibrom	Guard Star	Parathion	(indoxacarb)
Actara (Platinum)	(fenthion)	(naled)	(permethrin) ¹	Pay Off	Sumithion
(thiamethoxam)	Baythroid	De-fend, Dimate	Guthion	(flucythrinate)	(fenitrothion)
Address	(cyfluthrin)	(dimethoate)	(azinphos-methyl)	Phosdrin	Supracide
(acephate)	BHC	Diazinon	Imidan	(mevinphos)	(methidathion)
Admire	Bidrin	(spectracide)	(phosmet)	Phosphamidon	Swat
(imidicloprid)	(dicrotophos)	Dimecron	Lannate D	Pounce	(bonyl)
Advantage	Capture	(phosphamidon)	(methomyl)	(permethrin)	Synthrin
Afugan	(bifenthrin)	Dursban, Eradex	Lindane	Proaxis	(resmethrin)
(pyrazophos)	Carzol	(chlorpyrifos)	Lorsban	(gamma-cyhalo-	Tameron
Ambush	Cidial	Ectrin	(chlorpyrifos)	thrin)	(methamidophos)
(permethrin)	(phenthoate)	(fenvalerate)	Malathion	Proclaim	Temik
Ammo (Fury)	Commodore	EPN	(Malathion G)	(emamectin)	(aldicarb)
(>.025 lb/acre)	(lambda-cyhalo-	Ethyl guthion	Matacil	Provado	TEPP
(cypermethrin)	thrin)	(azinphos-ethyl)	(aminocarb)	(imidachloprid)	Vapona
Apollo	Curacron	Famphos	Mesuroil	Pydrin	(dichlorvos)
(clofentezine)	Cygon	(famphur)	(methiocarb)	(fenvalerate 0.1	Warrior
Arsenicals	(dimethoate)	Ficam	Methyl parathion	lb/A) ²	(lambda-cyhalo-
Asana	Cymbush	(bendiocarb)	Monitor	Pyramite	thrin)
(esfenvalerate)	Cythion	Folimat	(methamidophos)	Rebelate	Zectran
Avaunt	(malathion)	Fipronil	Nemacur P	(dimethoate)	(mexacarbate)
(indoxacarb)	Danitol	Furadan F	(phenamiphos)	Resmethrin	Zephyr (Agri-Mek)
Avid	(fenopropathin)	(carbofuran)	Nexter	Scout	(abamectin)
(avermectin)	Dasanit	Fury	(pyridaben)	(tralomethrin)	
Azodrin	(fensulfothion)	(zeta-cypermethrin)	Nudrin	Sevin	
(monocrotophos)			(methomyl)	(carbaryl) ³	

¹Can be applied to ground in front of beehives for the control of small hive beetles.

²Can be applied in the late evening at rate of 0.1 lb/A or less.

³Some formulations of Sevin XLR are rated as moderately toxic.

Group II. Moderately Toxic

These can be used around bees if dosage, timing, and method of application are correct, but should not be applied directly on bees in the field or at the colonies.

Abate	Carzol	Di-Syston	Larvin	Oil sprays	Systox (demeton)
(temophos)	(formetanate)	(disulfoton)	(thiocarb)	(superior type)	Thimet
Agritox	Chlordane	Dyfonate	Metasystox	Pirimor	(phorate) ²
(trichloronate)	Ciodrin	(fonofos)	(demeton-s-	(pirimicarb)	Thionex
Assail	(crotoxyphos)	endrin	methyl)	Pyramat	(endosulfan)
(acetamiprid)	Coumaphos ¹	Esteem	Metasystox R	Rhonthane (RDE)	Trithion
Banol	(Agridip, Asunthol)	(pyriproxyfen)	(oxydemeton-	SpinTor	(carbophenothion)
(carbanolate)	Counter	Ethodan	methyl)	(Conserve SC)	Vydate
Bolstar	(terbufos)	(Ethion)	Mocap	(Entrust)	(oxamyl)
(sulprofos)	Decis	Korlan	(ethoprop)	(spinosad)	
	(deltamethrin)	(ronnel)			

¹Checkmite (coumaphos) strip can be used in beehives to treat for varroa mites and small hive beetles.

²Thimet EC should only be applied during late evening.

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Group III. Relatively Nontoxic

These can be used around bees with a minimum of injury

Acaraben (chlorobenzilate)	<i>Bacillus thuringiensis</i> (Accoate, Biotrol, Dipel, Thuricide)	Dinocap (Karathane)	Isomate	Omite (propargite)	Saphos (menazon)
Acarol (bromopropylate)		Dylox (trichlorfon)	Kelthane (dicofol)	Ovotran (ovex)	Savey (hexythiazox)
Agri-Mek (avermectin)	Calypso (thiacloprid)	Ethrel (ethephon)	Mavrik (fluvalinate) ¹	Pentac (dienochlor)	Spur (fluvalinalate)
Allethrin	Chloroparacide (chlorbenside)	Esteem (pyriproxyfen)	methoxychlor (Marlate)	Plictran [mitacid] (cyhexatin)	Surround (kaolin)
Altosid (methoprene)	Confirm (tebufenozide)	Fujimite (fenpyroximate)	Morestan (oxythioquinox)	Pynamin	tetram
Amitraz	Cyd-X (CM granulovirus)	Fulfill (pymetrozine)	Murvesco (fenson)	Pyrellin (rotenone/pyrithrin)	Trigard (cyromazine)
Apollo (clofentezine)	cyrolite	<i>Heliothis polyhedrosis</i> virus	Neemix (Align) (azadirachtin)	pyrethrum (natural)	Vendex (fenbutatin oxide)
Aza-direct (azadirachtin)	Dessin (dinobuton)	Intrepid (methoxyfenozide)	Neotran	rotenone	Zeal (etoxazole)
	Dimilin (diflubenzuron)		nicotine	ryania	
				sabadilla	

¹Fluvalinate is used in Apistan strips to treat beehives for varroa mites. It is illegal to use Mavrik in hives.

Fungicides

As a general rule, fungicides are safe to use around honey bees.

Afugan (pyrazophos)	Captan	Cyprix (dodine)	Karathane	Phygon (dichlone)	Vitavax (carboxin)
Arasan (thiram)	copper oxides	Dithane D-14 (nabam)	Maneb	Plantvax (oxycarboxin)	Zerlate (Ziram)
Benlate (benomyl)	copper oxychloride sulfate	Du-Ter (fentin hydroxide)	Morocide (binapaeryl)	Polyram (metriam)	Zineb
bordeaux mixture	cupric hydroxide (Kocide)	Dyrene (anilazine)	Mylone (dazomet)	sulfur	
Bravo (chlorothalonil)		ferbam		Syllit (dodine)	

Herbicides, Defoliants and Dessicants

Atrex (atrazine)	Bladex (cyanazine)	diquat	IPC (propham)		Sencor (metribuzin)
Alanap (naptalam)	cacodylic acid	DSMA	Karmex (diuron)	Pendimethalin (Prowl)	Sinbar (terbacil)
Amiben (chloramben)	Caparol (prometryn)	Endothal (endothal)	Kerb (proamide)	Phenmedipham (Betanal)	Surflan (oryzalin)
Amitrol	Cotoran (fluometuron)	Eptam	Lasso (alachlor)	Pramitol (prometone)	Sutan (butylate)
Ammate	2,4-D	Folex (desmedipham)	Lorox (linuron)	Princep (simazine)	Tordon (picloram)
Balan (benefin)	Daconate (MSMA)	Glyphosate	MCPA	Probe (methazole)	Treflan (trifluralin)
Banvel (dicamba)	dalapon	Gramoxone (paraquat)	Paarlan (isopropalin)	Ramrod (propachlor)	
Betanal AM (bentanex)	2,4-DB	Herbisan (EXD)	paraquat	Ronstar (oxadiazon)	
	2,4-DP (dichlorprop)	Hyvar (bromacil)			