

PROTECTING POLLINATORS FROM PESTICIDES

- Apply pesticides only when and where necessary. Use Integrated Pest Management, incorporating cultural, mechanical, and biological control methods wherever possible.
- Read and follow all product label instructions and requirements. Pay particular attention to the label precautions that indicate specific hazards to bees and other pollinators.
- Be aware of any bee hives in the area that could be affected by application. When spraying is necessary, notify beekeepers in advance, so that they can adequately protect bee hives.
- Use ground equipment instead of aircraft, especially near bee hives.

- Avoid application to crops in bloom where possible. If application is necessary, apply when bees are least likely to be actively foraging (after 3 p.m.).
- Reduce drift and avoid spraying onto non-target areas, including adjacent vegetation that may contain flowers attractive to bees.
- Where possible, leave a border of untreated vegetation between treated areas and areas where wildlife may be present.
- Store and dispose of all pesticides properly.
- If more than one pesticide can provide control, choose the least toxic product and formulation available.

Arkansas Pollinator Stewardship Program

This program seeks to minimize economic loss for both farmers and beekeepers by adequately managing row crop pests while minimizing impact of pesticides on honey bee colonies.

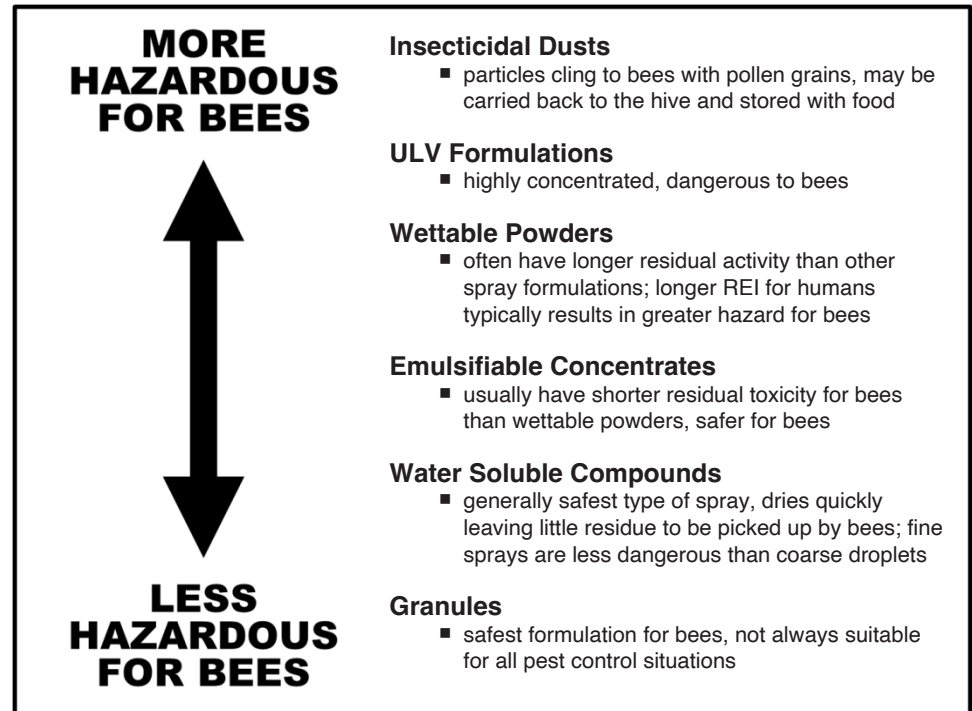
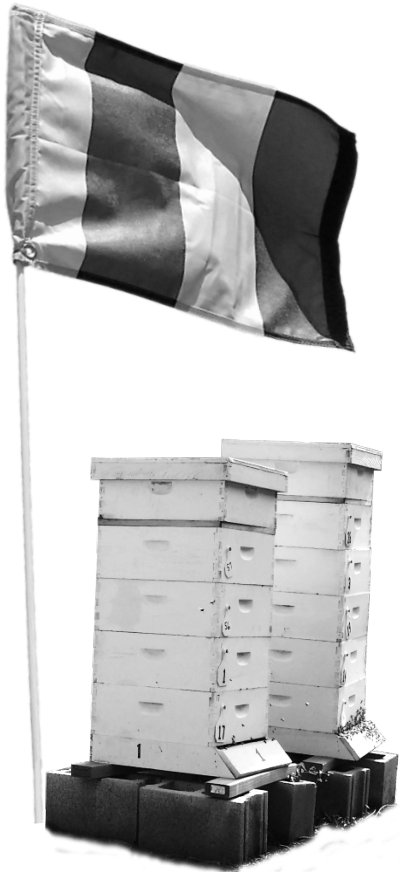
Cooperation and communication is encouraged among beekeepers, farmers and pesticide applicators.

The presence of the yellow and black Bee Aware flags will help to clearly identify locations where honey bees are located near crop areas.

For more information about this program or to obtain flags, contact:

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RELATIVE TOXICITY OF PESTICIDES TO HONEYBEES

Group 1 – HIGHLY TOXIC. Severe bee losses should be expected if the following pesticides are used when bees are present, if the product is applied near bee hives or if bees forage in the application area within a day after treatment.

Abamectin (Avermectin, Agri-Mek)	Deltamethrin (Battalion, Centynal)	Indoxacarb (Steward, Avaunt)	Phosmet (Imidan)
Acephate (Orthene)	Diazinon (Diazinon, Spectracide)	Lambda-cyhalothrin (Karate, Silencer, Warrior, Voliam)	Pyrethrin
Aldicarb (AgLogic)	Dicrotophos (Bidrin)	Malathion (Fyfanon, Malathion, Cythion)	Pyridaben Pyridaben (Nexter, Pyramite, Sanmite)
Alpha-cypermethrin (Fastac)	Dimethoate (Dimate)	Methidathion (Supracide)	Resmethrin (Scourge)
Azinphos-methyl (Guthion)	Dinotefuran (Safari)	Methiocarb (Mesurol)	Sabadilla (Veratran-D)
Beta-cyfluthrin (Baythroid XL, Tempo, Leverage)	Emamectin benzoate (Denim)	Methomyl (Lannate, Nudrin)	Sulfoxaflor (Transform, Closer)
Bifenthrin (Brigade, Capture, Discipline)	Esfenvalerate (Asana XL, Adjourn)	Methoprene	Thiamethoxam (Actara, Adage, Centric, Endigo, Platinum, Voliam)
Carbaryl (Sevin)	Fenpropathrin (Danitol, Tame)	Methyl parathion (Pennacp-M)	Zeta-cypermethrin (Mustang Maxx, Hero, Stallion)
Carbofuran (Furadan)	Fipronil (Regent, Taurus)	Naled (Dibrom, Trumpet)	
Chlorpyrifos (Dursban, Lorsban, Warhawk)	Gamma-cyhalothrin (Declare, Proaxis)	Oxamyl (Vydate)	
Clothianidin (Belay, Poncho)	Imidacloprid (Admire, Advise, Alias, Brigadier, Couraze, Merit, Pasada, Provado, Trimax, Wrangler)	Permethrin (Ambush, Pounce)	
Cyfluthrin (Decathlon, Tombstone, Tempo)		Phorate (Thimet)	
Cypermethrin (Holster, Cymbush)			

Group 2 – MODERATELY TOXIC. These pesticides can be used in the vicinity of bees as long as dosage, timing, method of application and conditions are correct. These products should NEVER be applied directly on bees in the field or near bee colony locations (apiaries). Apply late in evening, at night, or early morning if blooming plants are present.

Acetamiprid (Assail, Intruder, Strafer)	Cyromazine (Trigard)	Horticultural oil (Superior, Dormant, Summer)	Spirotetramat (Movento)
Azadirachtin (Aza-Direct, Azera, Neemix, Ecozin)	Diatomaceous earth	Novaluron (Diamond)	Temephos (Abate)
<i>Beauveria bassiana</i> (Mycotrol, Botaniguard)	Disulfoton (Di-Syston)	Primicarb	Terbufos (Counter)
Bifenazate (Acramite, Floramite)	Endosulfan (Thionex)	Pymetrozine (Fulfill)	Thiacloprid (Calypso)
Chlorfenapyr (Phantom, Pylon)	Ethoprop (Mocap)	Pyrethrum	Thiodicarb (Larvin)
Copper hydroxide (Kocide)(FUNGICIDE)	Fluvalinate (Mavrik)	Spinetoram (Radiant)	
Coumphaos (Co-Ral)	Glyphosate (Roundup)	Spinosad (Blackhawk, Spintor, Tracer)	

Group 3 – RELATIVELY NONTOXIC. These pesticides can generally be used around bees with a minimum of injury provided that dosage, timing, and method are correct. NEVER apply pesticides directly to bee hives.

Acaricides, Diseases, IGRs and Insecticides

Aldoxycarb (Standak)	Clofentezine (Apollo)	Lime sulfur	Spiromesifen (Oberon)
Amitraz (Mitac)	Diflubenzuron (Dimlin)	Metaldehyde bait (<i>MOLLUSCIDE</i>)	Tebufenozide (Confirm)
<i>Bacillus thuringiensis</i> (Bt, Agree, Biotrol, Javelin, Thurcide)	Etoazole (Zeal)	Methoxyfenozide (Intrepid)	
<i>Bacillus subtilis</i> (Rhapsody, Serenade, Cease)	Fenbutatin-oxide (Vendex)	<i>Nosema locustae</i> fungus (Canning)	
Calcium Polysulfide (Lime Sulfur, Sulforix)	Fenproximate (Akari, Fujimite)	Nucleopolyhedrovirus (Heligen)	
Chlorantraniliprole (Altacor, Coragen, Grubex, Prevathon)	Fonicamid (Carbine, Beleaf)	Progargite (Comite, Omite)	
	Hexythiazox (Onager, Savey)	Pyriproxyfen (Esteem, Knack)	
	Kaolin Clay (Surround)	Rotenone	

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Fungicides

Acibenzolar-S-methyl (Actigard)	Cyrodinil (Switch, Vanguard WP)	Mefenoxam (Maxim, Ridomil)	Tetraconazole (Mettle)
Aluminum tris O-ethyl phosphonate (Alliette, Fosetyl-Al)	Difenoconazole (Inspire, Quadrus, Revus)	Metconazole (Quash)	Thiophanate-methyl (Topsin-M)
Azoxystrobin (Abound, Quadris)	Dodine (Syllit)	Metrafenone (Vivando)	Thiram (Arasan, Mercuram, Nonersan, Thiramad)
Benomyl (Benlate)	Fenarimol (Bloc, Rimidin, Rubigan, Vintage)	Myclobutanil (Rally, Sonoma)	Trifloxystrobin (Flint, Stratego, Compass)
Bordeaux mixture	Fenbuconazole (Indar)	Nabam (Parzate)	Triflumizole (Procure)
Boscalid (Endura, Pristine)	Fenhexamid (Elevate 50 WDG)	Penthiopyrad (Fontelis)	Triphenyltin hydroxide (Super Tin)
Calcium Polysulfide (Lime Sulfur, Sulforix)	Fluazinam (Omega 500F)	Potassium bicarbonate (MilStop, Greencure, Kaligreen)	Ziram (Vancide)
Captan (Captan, Captec, Captevate)	Fludioxonil (Switch)	Propiconazole (Propicure, Quilt, Tilt)	Zoxamide (Gavel, Zing)
Chlorothalonil (Bravo, Echo)	Fluopicolide (Presidio)	Pyraclostrobin (Cabrio, Pristine)	
Copper 8-quinolate	Fluopyram (Luna)	Pyrimethanil (Luna, Scala)	
Copper sulfate—monohydrated	Iprodione (Rovral)	Quinoxifen (Quintec)	
Cuprous oxide	Kresoxim methyl (Sovran)	<i>Streptomyces lydicus</i> (Actinovate)	
Cyflufenamid (Miltrex, Torino)	Mancozeb (Dithane, Gavel, Manzate, Penncozeb, Ridomil Gold MZ)	Tebuconazole (Adament, Luna, Orius)	
Cymoxanil (Curzate 60DF, Tanos)	Maneb (Manzate)	Sulfur (various)	

Herbicides, Defoliants, Desiccants and PGRs

2,4-D	Cyhalofop-butyl (Clincher)	Fluthiacet-methyl (Athem, Cadet)	Prometryn (Caparol)
2,4-DB (Butyrac)	Dicamba (Banvel)	Foramsulfuron (Option)	Pronamide (Kerb)
Acetochlor	Dichlobenil (Casoron)	Imazapyr (Arsenal)	Propanil (Stam F-34)
Alachlor (Lasso)	Diflufenzopyr (Distinct)	Imazamox (Raptor)	Quinclorac (Facet)
Ammonium sulfate	EPTC (Eptam)	Isoxaflutole (Balance)	S-metolachlor (Dual)
Atrazine (Aatrex)	Ethephon (Prep)	Linuron (Lorox)	Simazine (Princep)
Bentazon (Basagran)	Ethalfuralin (Sonalan)	MCPA (Bonide)	Sodium chlorate (Defol)
Bromacil (Hyvar)	Flufenacet (Axiom DF)	Metribuzin (Sencor, Cloak)	Terbacil (Sinbar)
Clodinafop-propargyl (Discover)	Fluometuron (Cotoran)	Mesotrione (Callisto)	Tribufos (Def, Folex)
Cloproxydim (Select)	Flumioxazin (Valor)	Paraquat Dichloride (Paraquat)	Trifluralin (Treflan)
Cloransulam-methyl (First-Rate)	Fluridone (Brake, Sonar)	Picloram (Tordon)	
Cyanazine (Bladex)	Fluroxypyr (Starane EC)	Prohexadone calcium (Apogee PGR, Baseline)	

Sources:

Hooven et. al (2006) How to Reduce Bee Poisoning from Pesticides. Pacific Northwest Extension Publication PNW591. <https://extension.oregonstate.edu/catalog/pub/pnw-591-how-reduce-bee-poisoning-pesticides>

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