PROTECT HONEY BEES FROM PESTICIDES

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Honey bees are our most beneficial insect. The estimated value of honey bee pollination in the US is $14 billion. Many commercially grown crops in South Carolina are heavily dependent on honey bees for good pollination. Annual farm cash receipts of crops harvested in South Carolina that are dependent on honey bees for pollination are estimated at $25 million. This does not include home-grown vegetables and fruits and plants for wildlife that are highly dependent on honey bees for pollination.

Use integrated pest management recommendations whenever possible to minimize harmful effects to our beneficial insects. Many pesticides are extremely toxic to honey bees. The kind and amount of pesticide is important. Pesticides should be used only when necessary, especially if flowering plants are present that are attractive to bees. Select the least toxic pesticide to get the job done when possible and use the least hazardous method of application. Granular pesticide formulations are safest. Directed sprays applied with ground equipment are the next safest method for applying pesticides to protect bees. Aerially applied dusts or sprays are the most likely to contact bees and cause problems. Apply pesticides when the air is calm to reduce drift into areas where bees may be foraging or nesting. If a pesticide application is necessary, apply in late afternoon or evening when bees are not present. If managed bee colonies are present, it is best to give the beekeeper plenty of notice -- 3-4 days if possible -- of your intentions. The beekeeper has the option to relocate his bee colonies if adjacent fields are to be sprayed. If bee colonies cannot be removed on short notice, the beekeeper may cover his beehives with wet burlap for no longer than 2 days. It will be necessary for the beekeeper to spray covered hives with water and keep the burlap wet, especially in hot weather.

Beekeepers are advised to cooperate with growers in the area to help protect bees. Beekeepers should scout the area before bee colony placement to gain a good understanding of local farming practices, especially the use of highly toxic pesticides. Beekeepers are ill-advised to place their colonies in pest density areas which require multiple pesticide applications. An example is cotton growing areas where boll weevil eradication is expected. Beekeepers should post their name and contact information in the apiary or on colonies for identification purposes.

The following pesticides are grouped according to their relative toxicity to honey bees.

Group I - *Highly Toxic*.

Severe bee losses are expected if these pesticides are applied to flowering crops or weeds which are attractive to bees or when these pesticides are applied near a beehive. These pesticides will remain hazardous to foraging bees for up to 24 hours or longer.

abamectin (Agri-Mek, Zephyr)
acephate (Orthene, Address)
aminocarb (Matacil)
arsenicals
avemectin (AVID)
azinphosmethyl (Guthion)
bendiocarb (Ficam)
benzene hexachloride (BHC)
bifenthrin (Brigade, Capture)
bifenazate (Acramite)
bonyl (Swat)
calcium arsenate
carbaryl (Sevin, Sevin 80 S, Sevin XLR-Plus)
carbofuran (Furadan)
carbosulfan (Vantage)
chlorpyrifos (Dursban, Eradex, Lorsban)
chlorethoxyfos (Fortress)
clofentezine (Apollo)
clothianidin (Poncho 600)
crotoxyphos (Cyodrin)
cyfluthrin (Baythroid)
cyhalothrin (Karate, Warrior)
cypermethrin (Ammo, Cymbush)
d-phenothrin (Sumithrin)
decamethrin (Decis)
deltamethrin (Decis)
diazinon (Diazinon, Spectracide)
dichlorvos (DDVP, Vapona)
dicrotophos (Bidrin)
dimethoate (Cygon, Dimethoate, Rebelate)
emamectin (Proclaim)
endosulfan (Thiodan)
EPN
esfenvalerate (Asana)
ethyl parathion (Parathion)
famoxadone (Famoxate)
famphur (Famphos)
fenitrothion (Sumithion))
fenpropathrin (Danitol, Dasanit)
fensulfothion (Dasanit)
fenthion (Baytex)

fenvalerate (Ectrin, Pydrin)
fipronil
flucythrinate (Pay Off)
famoxadone (Famoxate)
formetanate (Carzol)
gamma-cyhalothrin, (Proaxis)
heptachlor
hexythiazox (Savey)
imidacloprid (Admire, Provado)
imidan
indoxacarb (Avaunt, Steward)
lambda-cyhalothrin (Commodore, Warrior)
lead arsenate
lindane (BHC)
LPOS (Sulfotine, RAID TVK)
malathion (Cythion, ULV)
methamidophos (Monitor, Tameron)
methidathion (Supracide)
methiocarb (Mesurol)
methomyl (Lannate, Nudrin)
methprene
methyl parathion (Penncap-M)
methyl parathion EC
mevinphos (Phosdrin)
mexacarbate (Zectran)
monocrotophos (Azodrin)
naled (Dibrom)2
omethoate (Folimat)
oxamyl (Vydate >1 lb/A)
parathion
phenthoate (Cidial)
phenamiphos (Nemacur P)
permethrin (Ambush, Gard Star, Pounce)
phorate (Thimet EC)
phosdrin
phosmet (Imidan)
phosphamidon (Dimecron)
polymer-encapsulated methyl parathion (Penncap-M)
prallethrin (ETOH)
proparite (Omite)
propoxur (Baygon)
pyridaben (Pyramite)
pyrazophos (Afugan)
resmethrin (Synthrin, SPB-1382)
spinosid (XDE-105, Tracer)
tebufenozide (Confirm)
TEPP[2]
tetrachlorvinphos (Appex, Gardona)
thiamethoxam (Actara, Platinum)
tralomethrin (Scout)
zeta-cypermethrin (Fury, Mustang)

Group II - *Moderately Hazardous*. *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 directed at the hive.*

aldicarb (Temik)
aspon (ASP-51)
aldicarb sulfoxide
acetamiprid (Assail)
aluminum phosphide (Phostoxin)
Bacillus thuringiensis (Di-Beta)
bifenazate (Floramite)
binapacryl
biothion
carbaryl (Sevin XLR formulation, Sevinmol)
carbanolate (Banol)
carbophenothion (Trithion)
chlorfeninphos (Sopona)
coumaphos (Agridip, Asunthol, Co-Ral)
crotoxyphos (Ciodrin)
cypermethrin (Ammo)
cyromazine (Trigard)
deltamethrin (Decis)
demeton (Systox)
demeton-s-methyl (Metasystox)
diatomaceous earth (Diatect)
disulfoton (Di-Syston)
dichlofenthion
dioxathion (Delnav)
DSMA
emamectin benzoate (Proclaim)
endosulfan (Thiodan <0.5 lb/A, Thionex)
endrin
ethion (Ethodan)
ethoprop (Mocap)
ethyulan (Perthane)
fluvalinate (Mavrik)
fonofos (Dyfonate)
formetanate (Carzol)
fundal (Galecron)
malathion (Cythion, ULV <3 fl oz/A)
methyl demeton (Metasystox)
mirex
MSMA
neem (Azatin, Neemix)
oil sprays (superior type)
oxamyl (Vydate <0.5 lb/A)
oxydemeton-methyl (Metasystox R)
paraquat
perthane
phorate (Thimet)
phosalone (Zolone)
pirimicarb (Pirimor)
profenfox (Curacron)
propamocarb (Carbamult)
propamocarb hydrochloride (Banol)
pymetrozine (Fulfill)
Pyramat
pyrethrum
pyriproxyfen (Esteem)
RDE (Rhonthane)

ronnel (Co-Ral, Korlan)
sabadilla
spinosad (SpinTor, Conserve SC, Entrust)
sulprofos (Bolstar)
stirofos (Rabon)
sumithrin (Anvillollo)
summer oil
tartar emetic
TDE
temephos (Abate)
terbufos (Counter)
trichlronate (Agritox)
thiacloprid (Calypso, YRC-2894)
thiamethoxam (Actara, Platinum)
thiazopyr (Mandate, Visor)
thiodicarb (Larvin)
trichoronate (Agritox)
zephyr

Group III - *Relatively Nonhazardous*. *These can be used around bees with a minimal risk of injury.*

allethrin (Pynamin)
amitraz (Mitac)
amitrole
avermectin (Agr-Mek)
azadirachtin (Align)
azoxystrobin (Abound)
Bacillus thuringiensis (Biobit, DiPel, Full-Bac, Javelin, MVP)
Baculovirus heliothis
Beauveria (Mycotrol)
benomyl (Benlate)
binapacryl (Morocide)
bordeaux mixture
bromopropylate (Acarol)
bromoxynil
capsaicin (Hot Pepper Wax)
captan
carbaryl (Sevin G, Bait G)
carbofuran (Furadan G)
chloramben
chlorbenzide (Mitox)
chlorobenzilate (Acaraben)
chlordimeform (Fundal)
chlorobenzilate (Acaraben)
chlorothalonil (Bravo)
copper compounds (Kocide)
copper oxychloride sulphate
copper 8-quinolinolate
copper sulfate (Monohydrated)
cryolite (Cryolite, Kryocide)
cyromazine (Trigard)
dalapon
dazomet (Mylone)
demeton (Systox)
dexon
diazinon (Diazinon G)
dicamba (Banvel D)
dichlone (Phygon)
dicofol (Kelthane)
difolatan
diflubenzuron (Dimilin)
dimite (DMC)
dinobuton (Dessin)
dinocap (Karathane)
diquat
disulfoton (Di-Syston G)
dodine (Cyprex)
dyrene
endothall
EPTC (Eptam)
ethephon (Ethrel)
ethion (Ethion)
ethoprop (Mocap G)
fenbutatin-oxide (Vendex)
fenhexamid (Elevate)
fenson (Murvesco)
ferbam
fluvalinate (Mavrik, Spur)
folpet (Phaltan)
garlic barrier
genite 923
glyodin (Glyoxide)
heliothis polyhedrosis virus
hexythiazox (Savey)
kaolin (Surround)
karathane (Dinocap)
kepone
malathion (Malathion G)
menazon (Saphos)
mancozeb (Dithane M-45)
maneb (Dithane M-22)
MCPA
menazon (Saphos)
metaldehyde (Metaldehyde Bait)
methoprene (Altosid)
methoxychlor (Marlate)
metiram (Polyram) - F1
monuron (Telvar)
myclobutanil (Rally)
nabam (Parzate)
nemagon
neotran
nicotine
nicotine sulfate
ovex
oxythioquinox (Morestan)
pentac
propargite (Omite)
pyrethrum (natural)
pyrimidinamine (Vangard)
pyriproxyfen (Esteem)
rotenone (Rotenone)
ryania (Rynodine)
sabadilla
silvex
simazine (Princep)
soap (M-Pede)
sulfur
tebufenozide (Confirm)

TDE (Rhothane)
tetradifon (Tedion)
tetram
thioquinox (Eradex)
thiram (Arasan)
toxaphene
trichlorfon (Dylox)
trifloxystrobin (Flint)
vendex
zineb (Dithane)
ziram
2,4-D
2,4-DB
2,4,5-T

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[1]Fungicides

[2]Mevinphos (Phosdrin*), naled (Dibrom*), and TEPP have short residual activity and kill only the bees contacted at time of treatment or shortly thereafter. They are usually safe to use when bees are not in flight; they are not safe to use around colonies.

[3]Not all *Bacillus thuringiensis* insecticides are safe for bees. The label for XenTari® (Valent BioSciences), with active ingredient *B. thuringiensis aizawai*, reads "This product is highly toxic to honey bees exposed to direct treatment. Do not apply this product while bees are actively visiting the treatment area."

[4]List or information derived in part from Delaplane, K., University of Georgia, Tarpy, D., North Carolina State University, Fell, R., Virginia Tech, Johansen, C.A. and Mayer, D.F. Pollination Protection. 1990, Wicwas Press; Bulletin E-53-W, Hunt, G.J., Purdue University; Environmental Entomology 33(5):1151-115