



Toxicity of Insecticides to Insect Pollinators

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Insect pollinators are essential for cross pollinating many crops. From 20,000 to 40,000 female alfalfa leafcutter bees per acre are needed to adequately pollinate one acre of alfalfa grown for seed production.

Because of the importance of insect pollinators, farmers, beekeepers and the pest control industry are obliged to cooperate closely to reduce the losses of beneficial insects to a minimum. Many of the insecticides are highly toxic to the all-important honey bee and other pollinators. For the protection of these useful insects, it is essential that only recommended materials be used and that these be applied at the proper time and in the proper amount.

Things to Consider When Using Insecticides

—Read the label and follow approved local, state and federal recommendations.

—The kind and amount of insecticide used is important. Use the proper dosage of the safest material to bees that will give good pest control.

—Alfalfa leafcutter bee and alkali bee are more susceptible to insecticides than is the honey bee.

—With few exceptions, dusts are more hazardous to bees than sprays.

—Applications by airplanes are more hazardous to bees than by ground equipment because of drift deposit.

—Covering colonies and nests with damp burlap or other material during and for 1 to 2 hours after an early morning treatment gives added protection. Covering is important when treating by airplane.

—Treatments are most hazardous when bees are foraging. Treatments over colonies and nests in hot weather when bees are flying will cause severe losses. Treatments during the night or early morning before bees begin to forage are the safest.

—Location of colonies and nests is important. Those located in the field and treated over will sustain more loss than colonies and nests located at the edge or outside of the field and not treated over. Colonies and nests moved into fields a few days after treatment usually escape damage.

—Drift to neighboring fields attractive to bees has caused many losses. Using a hazardous material to pollinators when treating a non-seed crop with cover crops, weeds or wild flowers in bloom has caused heavy bee losses.

—When using material hazardous to pollinators notify the owner so that he may move, cover or otherwise protect his bees.

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RELATIVE TOXICITY OF INSECTICIDES

TOXICITY RATINGS

0. No data. Do not use.
1. Hazardous to bees at any time.
2. Not hazardous **if** applied in late evening after bees have quit foraging.
3. Not hazardous **if** applied in either evening or early morning when bees are not foraging.
4. Not hazardous to bees at any time.

Insecticide	Alfalfa leaf-cutter bee	Alkali bee	Honeybee
Bidrin	1	1	1
carbaryl (Sevin)	1	1	1
carbophenothion (Trithion)	1	2	3
chlordane	0	0	1
2,4-D (herbicide)	0	0	4
DDT	1	3	3
demeton (Systox).....	3	3	3
diazinon	0	1	1
dicofol (Kelthane)	4	4	4
dieldrin	0	1	1
dimethoate (Cygon)	1	1	1
disulfoton (Di-Syston)†	0	0	3
endosulfan (Thiodan)	1	1	3
endrin	1	2	3
heptachlor	0	0	1
lindane	0	0	1
malathion†	1	2	1
methoxychlor	0	3	3
mevinphos (Phosdrin)*	0	1	1
naled (Dibrom)*	2	3	3
oxydemetonmethyl (Meta-Systox-R)	3	3	3
parathion (Niron)	1	1	1
phorate (Thimet)‡	0	0	3
phosphamidon (Dimecron)	1	1	1
tepp*	0	3	3
tetradifon (Tedion)	0	4	4
toxaphene	1	3	3
trichlorfon (Dylox)	4	2	3
DDT+toxaphene	1	2	3
toxaphene+naled	2	0	3

* Naled, mevinphos and TEPP have such short residual activity that they kill only bees contacted at treatment time or shortly thereafter. These materials are usually safe to use when bees are not in flight. These materials are not safe to use around colonies.

† Malathion has been used on thousands of acres of blooming alfalfa without serious loss of bees. However, occasional heavy losses have occurred, particularly under high temperatures. LVC technical malathion is very hazardous to all bees.

‡ No problem exists when phorate and disulfoton are used as seed treatments.

The toxicity ratings are from Anderson, L.D., et al. 1967. Toxicity of Pesticides to Honeybees. Calif. Agric. Ext. Ser. AXT-251, Johansen, Carl, 1967. Toxicity of Insecticides to the Alkali bee and the Alfalfa leafcutter bee. Washington State University. Cir. 475. and USDA Agric. Handbook No. 335, 1967.

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