- Use ground equipment instead of aerial application to apply pesticides near bee hives. Apply pesticides in late afternoon or at night when bees are not working the blooms.
- Avoid drift of pesticides onto plants that are attractive to bees.
- Notify beekeepers several days before applying any pesticide that is hazardous to honey bees. This will give them a chance to protect their colonies. However, notifications are not a release of responsibility.
- Use pesticides only according to the directions on the label.
- **Read and follow all label directions,**
- Do not use pesticides on plants that are not listed on the label.

Precautions for Beekeepers

- Place colonies where they will be away from fields that are routinely treated with hazardous pesticides and will not be subjected to pesticide drifts.
- Identify your apiary. Post your name, address, and phone number in a conspicuous place near your apiary. Let farmers and custom applicators in your area know where your apiaries are located so they will not unknowingly poison them.
- Be familiar with pesticides commonly used in your area and what their application dates are.
- Relocate the colonies if they are likely to be exposed to hazardous pesticides. Even moving hives a short distance of 1/4 mile from the treated area usually significantly reduces injury to bees. Moving bees one mile away from the treated field reduces bee kills by 60 percent.
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PROTECTING HONEY BEES FROM PESTICIDES

Honeybees are some of our most beneficial insects, yet most of us probably take them for granted. Not only do they produce a surplus of honey and beeswax, they are almost indispensable in the pollination of such important crops as apples, blueberries, sunflowers, melons and cucumbers.

The honey bee is the only insect that can be moved quickly and in the desired numbers to effect the pollination of cultivated crops, commercial gardens and orchards.

Pesticide Problems

Honey bees and other insect pollinators play an important role in the production of many crops in Oklahoma. However, since most crops must be protected from insect pests and diseases, pesticide poisoning is the most serious problem for pollinating insects in agricultural areas.

Protecting pollinators, especially honey bees, from pesticide poisoning should be part of any pesticide program.

The following recommendations can help minimize bee kills.

Pesticides on Blossoms. The blossom is usually the only part of a plant that bees visit. To avoid killing bees, do not apply pesticides hazardous to bees during the blooming period. Treating non-blooming crops with a hazardous pesticide when cover crops, weeds, or wild flowers are in bloom within (or near) the treated field may also cause heavy bee losses.

Drift of Pesticides. Drift occurs from nearly all spray or dust applications of pesticides from a short distance to miles downwind. Pesticide dusts drift farther than sprays. Pesticides applied by plane usually drift farther then those applied by ground equipment. Generally, it is less hazardous to apply pesticides near apiaries with ground equipment than by plane. Drift can be reduced by applying pesticides in the evening or early morning when the air is calm.

Time of Application. Ideally, pesticides should be applied when there is no wind and when bees are not visiting plants in the area. In general, evening or early night applications are the least harmful to bees.

Formulation of Pesticides. Dusts are usually more hazardous to bees than sprays. Wettable powders often have a longer residual effect than emulsifiable concentrates. Granular pesticides seem to present very little hazard. Ultra-low volume (ULV) formulations of some pesticides are much more toxic than regular sprays.

Toxicity of Pesticides. Most agricultural pesticides have been tested for their toxicity to honey bees. Insecticides affect bees in one or more ways: as stomach poisons, as contact poisons, and as fumigants. Pyrethroids, organophosphates, and carbamates vary in their toxicity to bees from relatively non-hazardous to very hazardous, depending upon the individual material or combination of materials.

Herbicides, defoliants, and desiccants such as paraquat, MAA, and MSMA reportedly were extremely toxic when fed to newly emerged worker honey bees or when sprayed onto older bees in field tests.

Fungicides seem to cause little trouble for honey bees.

Precautions for Farmers and Applicators

- Apply pesticides only when needed.
- Use the recommended pesticides at the lowest effective rate.
- Use the pesticide least hazardous to bees that will control the pest involved. If all recommended pesticides are equally hazardous to bees, use the one that has the shortest residual effect.
- Use sprays or granules instead of dusts.
- Make as few treatments as possible, as repeated applications greatly increase the damage to colonies.
- Do not treat an entire field or area if local spot treatments will control the harmful pests.