



# The Minnesota Honey Bee Battle

## MN Supreme Court protects pollinators from pesticides

In a landmark decision, the Minnesota Supreme Court ruled that landowners who spray pesticides on their property can be held liable for damages to beekeepers' neighboring apiaries. (*Anderson, et al. v. International Paper*, March 2005) The case was brought by three beekeepers who raise bees for honey and sale. This ruling sets a standard that could have dramatic ramifications for pesticide use across the country. The court found that, regardless of prior opinions identifying foraging bees as "trespassers," landowners with knowledge or notice of foraging honey bees on their property are still responsible to provide reasonable care in the application of pesticides.

In the most recent development in the case, a local pesticide spray applicator, who applied the insecticide Sevin XLR Plus (carbaryl) to hybrid poplar tree plantations, agreed to relinquish his spray airplane and assign any future insurance claims as settlement, and the beekeepers withdrew monetary claims for damages arising from lost beehives. This settlement follows an earlier settlement in summer 2005 between the beekeepers and the MN Department of Natural Resources (DNR) in which the department agreed to pay \$335,000 to the beekeepers and publish a brochure educating pesticide users on the importance of protecting pollinators, such as bees, when using these products. The spraying occurred partly on land managed by MN DNR as an experimental plot for a biomass fuel project.

The MN honey bee battle began in the late 1990s, when beekeepers began to notice high mortality rates and sharp declines in honey production of commercial beehives in the vicinity of trees enrolled in the Federal Conservation Reserve Program (CRP), which are regularly sprayed with various in-

secticides and herbicides. While environmentalists place the highest priority on restoring native bee populations, which are in decline due to pesticide use, loss of habitat and other forces, domesticated honey bees play an important role in agricultural production.

Additional claims by the beekeepers against International Paper Company for negligent pesticide spraying remain unresolved. A tentative court date is scheduled in Douglas County District Court for mid-June 2006.

### Backgrounder: Disappearing Pollinators

Eds. Note. When the MN court decision hit the airwaves, we contacted Xerces Society for Invertebrate Conservation, the best non-profit education organization on pollinator conservation. What follows is adapted from: Pollinator Conservation Handbook, "Pesticides" chapter. Shepherd, M., S. Buchmann, M. Vaughan, and S. Hoffman Black. 2003. Xerces Society for Invertebrate Conservation. Portland OR. For more information on this book, please contact the Xerces Society, [www.xerces.org](http://www.xerces.org) or 503-232-6639.

In the early 1970s, the blueberry farmers of New Brunswick, Canada experienced a sudden decline in harvests because of the disappearance of the native bumble bees, mason bees, and mining bees that pollinate their crops. The lack of bees, they learned later, was caused by the aerial spraying of the synthetic pyrethroid insecticide fenitrothion onto adjacent woodlands to kill spruce budworm. Even after the spraying was stopped, it took three years for bee populations

to rebound and for fruit harvests to recover to their pre-spraying levels. In the southwestern United States, beekeepers reported large kills of their honey bees after insecticides were applied to Bermuda grass grown for seed. The bees were apparently foraging for pollen on the grass flowers because there were not enough other blooming plants in these areas, and in the process they collected insecticide, which killed them. In Washington state, the organophosphate insecticide diazinon applied to control aphids on alfalfa also decimated foraging alkali bees, which are an important pollinator of alfalfa; the death of female bees led to a 95-percent drop in the number of underground bee larvae in three nearby nesting sites studied by one investigator.

Virtually all of the research on the effect of pesticides on bees focuses on honey bees because of their importance to agriculture. However, the use of managed populations of solitary bees as pollinators of some crops—in particular, alfalfa leafcutter (*Megachile rotundata*) and alkali bees (*Nomia melanderi*) for alfalfa—has provided opportunities to extend our understanding of the impact of pesticides on native bees. The incidents described above are just three well-documented poisonings out of the many thousands that have occurred. The documentation of the New Brunswick bee kill is unusual in that it relates to wild bees. Far more often, the impacts of pesticides on managed pollinators are documented while the extent of the killing of wild bees goes unnoted.

One thing is clear: insecticides and herbicides are having a disastrous effect on both managed and wild bee populations. Millions of pounds of pesticides are applied to farms, fields, lawns, flower beds, and roadsides every year. Insecticides kill pollinators directly, while herbicides reduce the diversity and abundance of the flowering plants that pollinators feed upon. Many pesticides degrade slowly, remaining as a lingering toxic hazard to pollinators and other wildlife.

Despite the threat, pesticide use in North America has continued to grow. In California, for example, pesticide sales

grew by an average of 12.4 million pounds per year between 1991 and 1998. In the United States, according to the Environmental Protection Agency (EPA), total pesticide use in 1998 and 1999 exceeded 1.2 billion pounds - more than 20 percent of the pesticides used worldwide. Herbicides accounted for the largest proportion of this usage, followed by insecticides and fungicides.

Pesticides are not just a problem on agricultural lands. Studies conducted by the U. S. Geologic Survey and some municipalities have detected higher concentrations of pesticides in streams in urban areas than in agricultural areas. We should not be surprised by this. A study in the Puget Sound Basin found that more pounds of pesticides were applied per acre in urban neighborhoods than on agricultural fields.

## Impacts of Pesticides

Foraging bees are poisoned by pesticides when they absorb the fast-acting toxic chemicals through their integument (the outer “skin” that forms their exoskeleton), drink toxic-tainted nectar, or gather pesticide-covered pollen or micro-encapsulated poisons. If they are foraging while the pesticides are being applied, the spray or dust covers them, killing significant numbers of bees in the field. If they are foraging on recently sprayed fields, they absorb toxic chemicals from the residues on plants, which kills them more slowly.

Smaller bees—the majority of native bees—are more sensitive; they have a larger surface area relative to their body volume and so absorb doses that are relatively higher. Thus, insecticide residues on plants remain toxic longer for smaller bees, and they are killed by lower concentrations of poisons (such as those resulting from spray drift). After a significant kill, beekeepers may find thousands of dead honey bees in and around each hive. One can only imagine the thousands of dead native bees that at the same time are scattered around the landscape out of sight.

## Planting Native Flora for Bees

Bees require two essential components in their habitat: somewhere to nest and flowers from which to gather nectar and pollen. Native plants are undoubtedly the best source of food for bees, because plants and their pollinators have coevolved. Listed below are some plants that are good sources of nectar or pollen. Individual species have not been included because we hope the list will be useful across the U.S. Use a wildflower guide or contact local nurseries to find your local species.

Aster, Black-eyed Susan, Caltrop, Creosote bush, Currant, Elder, Goldenrod, Huckleberry, Joe-pye weed, Lupine, Oregon grape, Penstemon, Purple coneflower, Rabbit-brush, Rhododendron, Sage, Scorpion-weed, Snowberry, Stonecrop, Sunflower, Wild buckwheat, Wild-lilac, Willow.



Even less-than-lethal doses of pesticides can have substantial adverse effects. Bees that are exposed outside the nest may have trouble navigating their way back to the nest after foraging, or they may be unable to fly at all. Other symptoms include aggressive or agitated behavior, jerky or wobbly movements, or paralysis, all of which make foraging and nest building difficult. Sub-lethal doses can result from direct contact with pesticides or from toxins brought into the nest with nectar and pollen, and may impact egg laying in the nest as well as the next generation of bees.

## Alternatives to Pesticides

There are many things you can do to eliminate or limit the need for pesticides.

- **Ensure that your plants are healthy.** A plant that is growing vigorously, with minimal stress, can avoid or outgrow many disease and insect pest problems. It is preferable to choose plants appropriate to the conditions rather than to try to create artificial conditions to suit an exotic plant. A locally native plant will by nature grow better in your local conditions than a non-native plant.
- **Good soil is the foundation of a healthy garden.** Providing soil amendments and adequate nutrients will benefit your plants. Conventional chemical-based and factory-manufactured fertilizers are not necessary; composts and natural fertilizers are very effective. Natural fertilizers tend to improve the soil not only by adding nutrients but by improving its structure and organic material content as well.
- **Recognize and work with naturally occurring controls against pests.** A healthy and diverse pollinator garden has most of the necessary habitat elements to encourage native predators or parasites of pest insects, while pesticides often eliminate the natural enemies of common pest species and leave you with chronic problems. You should also avoid over-the-counter biological controls, as they can cause long-term ecological problems. For example, the wide-scale release of non-native ladybird beetles (commonly referred to as “ladybugs”) is thought to be a key reason for the decline in native ladybird beetles. It is much better to encourage your own native insect controls than to introduce species that are not locally native.
- **More tips for a healthy lawn and garden.** In small areas, practices such as hand picking and crushing insects or spraying a stream of soapy water to dislodge aphids from plants may be practical and effective. You can also limit the spread of disease by practicing good sanitation—basically, removing diseased leaves and other material from the area. However, this may not be practical in large areas, where managers may want to implement the approach known as integrated pest management as an alternative to pesticides alone.

## When Pesticide Use Occurs

Although you likely do not use pesticides yourself, there may well be times when you find yourself talking to people who do. Explain to them that they would want to minimize the damage done to pollinators that benefit their plants, and to other insects that are the natural enemies of many pest insects. If pesticides are used, it is important they are not applied when pollinators are active, or during those seasons when there are blooms present on the plants. Finally, bee nesting areas, caterpillar host plants, and places where there are fly and beetle larvae should never be sprayed.

Studies have shown that greater quantities of pesticides are applied in domestic yards and gardens than on farmland. Home gardeners can buy any available product and use it without training or supervision, with the result that chemicals are often applied in back yards in quantities far greater than those recommended by the manufacturer.

Pesticides on larger, commercially managed landscapes have their own problems. They may be applied in a variety of ways, from backpack sprayers to aerial application. Pesticide drift from aerial spraying onto adjacent crops or wildflowers may kill 80 percent of foraging bees close to the source, but drift can continue to be dangerous for a mile and a half or further. Not only is aerial application an inefficient and destructive method, it is also an expensive one.

While there are EPA guidelines to protect pollinating insects during the application of pesticides, these have been developed to protect honey bee hives and the few other bee species that are managed for pollination. They provide little protection for wild bees, because there are no restrictions on pesticide use to protect pollinators when managed bees are not active, despite the fact that wild bees may be foraging on field margins or nearby wildlands. Moreover, unless people adhere to them, the guidelines offer no protection for pollinators at all. For example, spraying for mosquito abatement by local county and city governments should be done at night, but when “public health” programs get behind schedule, agencies do not necessarily follow their own guidelines. Daylight spraying can devastate local bee populations.

Pesticides will always have an impact on pollinators, whether it is because the poisons kill the bees directly in the fields or because they linger on foraging plants. Because of this, the best decision is to avoid pesticides use.

*The Xerces Society for Invertebrate Conservation is an international non-profit organization dedicated to protecting biological diversity. The Society works to protect invertebrates and their habitats through science-based advocacy, education, and conservation projects. In its Pollinator Conservation Program, the Xerces Society works with people from all walks of life to help them better understand the insects that provide the essential service of pollination, and provide them with the confidence and skills to protect these important creatures.*