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Protecting Honey Bees

from Area-wide Insecticide Applications

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We often discuss pollinators — with honey bees being the most familiar species — in terms of their national importance to agricultural production and food security. But for many individuals, keeping honey bees is also part of their livelihood — whether they earn their living through pollination services or by selling branded products that contain honey. Many individuals also keep honey bees on a much smaller scale as hobbyists, or they may generate extra income by selling "home-grown" honey at local farmers markets.

Whether you are a large apiarist or a beginning hobbyist, it is essential to understand and prepare your bees when a state agency announces any pesticide application program. Often, these agencies may announce area-wide programs to

control disease-spreading mosquitoes, emerald ash borer, gypsy moth, or other pests. It is important to prepare for any program where any pesticides are applied by air or ground application (such as, invasive weed control).

Insecticides, defined as any pesticide used to control insect pests, can be species-specific (such as *B.t.*). Insecticides can also be broad-spectrum, which means they are detrimental to all insects that come in contact with the sprays, including honey bees.

Minimizing the negative effects to honey bees depends upon beekeepers knowing what is being sprayed, the likely timeframe, and the targeted area. Once beekeepers have this information, they can prepare to protect their hives. This publication offers suggestions beekeepers can follow to protect the hives in their care.

Prepare Today for What Might Happen Tomorrow

Generally, government agencies provide little notice before they make area-wide insecticide sprays. That's why it is key to create a plan ahead of time to protect your hives. Being prepared is important from another perspective: The agency involved in the application may not compensate beekeepers for any hive losses.

Here are steps you can take in advance to put your colonies in the best possible position to successfully weather an area-wide application.

Keep Your BeeCheck.org Info Current

Do not forget to renew bee hive locations each year on BeeCheck.org. If you don't renew by March 1, your hives are removed from the database.

1. Register your hives on BeeCheck.org. If you have never used the site, navigate to the "BeeCheck Map" page and select Indiana. Once there, you can click on the "Add Apiary" button in upper left to begin.
   This is the single best way to protect your hives from a range of pesticide applications, now and in the future. Registering on this site allows pesticide applicators of all types (including agricultural applicators) to know where bees are located.
2. Contact your Purdue Extension county educator and share your contact information with them. Let the educator know you are a beekeeper and want to be updated about future pesticide applications.
3. Have equipment to cover your colonies and food to feed them. If you live in a county with a history of area-wide sprays, be prepared if and when a spray occurs (see below).

Confirm That an Aerial Pesticide Application Is Scheduled

If you hear from a fellow beekeeper, beekeeper association, or other person about a potential area-wide spray, it is important to confirm the information before preparing your colonies.

Contact your county extension educator or the agency directing the application to learn the latest updates first-hand. This should be your first point of contact. Purdue Extension county educators will know the specifics of any large-scale pest reduction program. If you do not know your county educator, then you can reach them at extension.purdue.edu/about.

Have a Plan to Deal With Aerial Applications

After confirming that an area-wide application will occur, you will generally have only a few days to act. Aerial insecticide applicators make every effort to target areas where pests, and no other insects/animals, are present. This is why they typically make applications while it is still dark, when honey bee activity is minimal.

However, even the most accurate aerial application methods may still result in pesticide drift into areas where bees live or forage. Your primary approach to reducing bee kills during and following aerial insecticide applications should be to safeguard bees by minimizing their opportunities to encounter pesticide residues.

The most effective way to limit risk is to move your colonies from the spray area. If this is not feasible, we recommend these five steps to help reduce the likelihood of your bees being exposed to insecticides:

1 Contact to your county extension educators and other state advisors for specific instructions about the chemicals being applied.

There are many different pesticides (including insecticides) that applicators use in area-wide applications. Each product varies in its environmental persistence and toxicity to honey bees. County educators and state advisors should have specific instructions for beekeepers and be able to tell you: the specific compounds being used, the timing of the application, and how long you should leave your colonies covered or have them removed from the application area. Educators and advisors also should be able to provide relevant contact information for the entities planning and applying the treatment.

2 Collect samples before applications are made.

Collect a cup to a pint of bees the day before the spray, and place them in a labeled glass container or labeled piece of aluminum foil. Make sure to include the date, time, and colony identification on the sample. Place the sample in the freezer. This sample may be useful to the Office of Indiana State Chemist (OISC) to compare with any dead bees that may be found after the spray is applied.

3 Ensure your colony has food and water inside.

You may have to leave your colonies sealed for more than 24 hours. It could be important for them to have water and food available inside the colony to help regulate temperature and to eat. To provide the highest likelihood of survival, add an internal feeder filled with light sugar syrup or water.

4 Cover colonies with a loose cloth or tarp that allows air flow.

Place a metal mesh screen material that bees cannot pass through across the hive entrance. This will allow ventilation and keep the bees inside. Do this the evening before the aerial application once the bees are in for the night. Leave the screen in place for a full 24 hours.

Depending on the time of year, colonies may be at risk for overheating even during a 24-hour period and certainly over longer periods. Set a reminder to yourself to remove the screen after the time has elapsed. We do not advise fully covering or sealing colonies, because temperatures in the hive can reach lethal levels very quickly.

Dark materials absorb light and generate unwanted heat in the hive. Make sure the covering you use is a light color. Photos provided by Krispn Given

5 Prepare to collect dead bees.

Place a sheet in front of your colonies to collect any dead bees after the spray. Collect these specimens in glass jars or aluminum foil (again, be sure to include the colony identification, date, time, and location), and immediately place the dead bees you collect in the freezer for later analysis.

It is critical to collect and freeze any specimens as quickly as possible — ultraviolet light, heat, and bacteria will break down dead bees, which can rapidly degrade the samples and affect the levels of pesticide residues found in them.

Report Possible Bee Deaths to OISC as Soon as Possible

If you suspect that an aerial application has resulted in deaths of your bees, contact the Office of Indiana State Chemist (OISC) Pesticide Division as soon as possible and initiate a complaint. Information, including the "Filing a Pesticide/Herbicide or Fertilizer/Manure Complaint form" is available at oisc.purdue.edu/pesticide.

The OISC will determine what, if any, pesticide residues are present on the samples you collected, and they may collect additional samples.

Find Out More

More information about pesticide drift and sample collection protocols are available in *Options for Dealing with a Pesticide Drift Incident* (Purdue Extension publication PPP-110), available from the Education Store (edustore.purdue.edu) or Purdue Pesticide Programs (ppp.purdue.edu).

It is important that you collect any dead bees — or those appearing lethargic or exhibiting tremors and uncoordinated movement — immediately. The longer you wait to collect the bees, the lower the likelihood of detecting pesticide residues. OISC does not charge you to investigate and analyze the samples, but you must file a complaint to initiate an investigation.

If they detect pesticide residues, OISC will determine whether a label violation has occurred. Note that any off-label uses, including those made by beekeepers, may be detected by this analysis, too. It is important to know that OISC's findings do not include the value of the loss (if any).

If OISC determines that an application violation resulted in bee deaths, then you will need to decide if and how you wish to quantify the loss. You also have to decide whether to seek compensation for your loss.

You can seek damages directly with the applicators, with insurance companies, or through civil proceedings. These options may also require you to contact the agency involved with the application to determine if they have a plan in place for indemnification, including possible compensation for any hive losses.

Conclusion

You have invested a lot of time, effort, and money managing your honey bees. Our goal is to ensure that when area-wide sprays occur you have some tools to protect your colonies. While applicators and agency planners seek to minimize the likelihood of honey bee mortality, the simple steps above can minimize those risks even further.

It's important to note that the steps we describe in this publication can protect your bees against a wide range of pesticide applications — not just aerial applications that target sporadic pest outbreaks. For most Indiana beekeepers, the risks of pesticide exposure are an unavoidable consequence of having neighbors. This is why registering the location of your colonies and working with local growers and homeowners may help protect your honey bees, sustain your hobby, and safeguard your livelihood.

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