Choosing pesticides to conserve natural enemies of pests

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2020 Empire State Producers Expo
January 14, 2020
Biocontrols I Session

Natural enemies of pests are going to help you out with pest control, so when you are applying pesticides, it's in your best interest to choose products that will have the least impact on them. Two quick points before we get into details for where to find this information:

1. Remember that the following information is not a substitute for a pesticide label. The label is the law, and you must read and follow the label of any pesticide you are using. Laws and labels change. It is your responsibility to use pesticides legally. Trade names used here are for convenience only; no endorsement of products is intended, nor is criticism of unnamed products implied. For questions about pesticide use, regulations, and safety, contact the Cornell Pesticide Management Education Program: pmep_webmaster@cornell.edu.
2. A great way to protect natural enemies is by following the steps for IPM. Preventing pests (e.g., through cultural strategies and exclusion), scouting to detect pests early when populations are low, and proper identification of pests will help you reduce your need to use pesticides and can save you money.

Ok, let's assume you're doing good IPM and you've gotten to the point where you need to choose a pesticide. How do you make the best choice for protecting natural enemies? Here are a few options. (Note that I did post about this about 2 years ago. I've learned more, so I thought an update would be in order.)

Read the label

This should go without saying. You should be doing this anyway when you are considering using a pesticide. The label may contain information about the compatibility of a pesticide with either natural enemies or pollinators. And of course it will contain important information about how to minimize risks to yourself and the environment when you use it.

EIQ

EIQ stands for Environmental Impact Quotient. You can read more details on the NYSIPM website, but in a nutshell the EIQ quantifies the risks of pesticides at the rates they are applied in the field (or greenhouse). You can use the EIQ calculator on the NYSIPM website to compare these numbers for different pesticides. The higher the number, the higher the risk. There are different components to the EIQ; risks to consumers, workers, and the environment (ecological). The ecological risk will include risks to natural enemies (as well as fish, birds, and bees).

Pocket IPM Greenhouse Scout App

Especially if you are growing in a greenhouse and releasing a lot of natural enemies, you may find this app helpful. In addition to providing information about compatibility of pesticides with arthropod natural enemies you may be releasing, you can also use it to help you keep records of scouting and product applications.

Cornell Guidelines

If you are a commercial producer, hopefully you are already using the Cornell Guidelines, as they are a wealth of information on many subjects. At least some of them also include information on the toxicity of different pesticides to natural enemies. For example, if you have the grape guidelines, check out Table 4.2.2 for insecticide toxicity to natural enemies.

Websites and apps from companies that produce natural enemies

Companies that sell natural enemies (especially predatory and parasitoid arthropods for greenhouse pest control) have an interest in making sure that customers don't inadvertently kill the natural enemies they buy with pesticides they are applying. I am aware of searchable databases or charts describing pesticide compatibility from four companies that sell (mostly) arthropod and nematode natural enemies: Agrobio, Biobest, BioWorks, and Koppert. There are of course other companies that supply natural enemies. Here I'm focusing on resources that help you choose pesticides to conserve natural enemies.

Agrobio: This website is also available as an app for Android (but not Apple) devices. To use it, start by clicking **Organisms selection** and choose the natural enemies you want to conserve. Then, click **Ingredients selection** and choose the pesticides you are thinking about applying. You can only search active ingredients, not product names. Finally, click **Query**. Use the legend to help you interpret the table that's produced.

Biobest: This website is also available as an app for Android and Apple devices. Use either the **Active ingredient** or the **Commercial product** tab to select pesticides by active ingredient or trade name. Then, search for the name of the **Beneficial organism** you want to conserve. Note that there are a lot of pesticide/natural enemy combinations for which toxicity data just aren't available. If you select a pesticide, then natural enemies for which no data are available will be grayed out in the **Beneficial organism** list. As you check boxes next to pesticides and natural enemies, a chart is automatically generated. The legend includes keys for information on toxicity (to natural enemies and bumble bees), application methods, and persistence of the product. You can generate a pdf of your results, but it won't include the legends.

BioWorks: Check out this resource that summarizes the compatibility of BioWorks biopesticides with arthropod and nematode natural enemies.

Koppert: This website is also available as an app for Android and Apple devices. Start by entering the name of the **Beneficial organism** you want to conserve. You can search by either the Koppert product name, or the Latin (scientific) name, but you can't select from a drop-down menu. Just start typing. Then, choose the **Agent** (pesticide), by either trade name or active ingredient. Again, you need to know the name; you can't select from a drop-down list. Start typing, and then check the box next to the product you are interested in. Click **Results** and be sure to click on 'Legend' at the bottom to get more information on interpreting the table. There is also a more complete explanation of information in the legend under **Info**.

Some caveats about these websites

Admittedly, finding information about conserving natural enemies that are not commercially available for release (e.g., in greenhouses) has some challenges. The websites I just described tend to focus on what you can buy and release, rather than on what may be naturally occurring in a field. Although sometimes there is overlap. These apps/websites don't include all natural enemies, and data aren't available for all natural enemy/pesticide combinations. Also, these websites/apps usually list natural enemies by scientific names. Do you know what the scientific name of a lacewing is? I didn't before I started this job!

To help with this last barrier, I created a chart to help you figure out what scientific names you should look for on these websites/apps if you want to conserve a particular natural enemy. It also includes information about which pests the natural enemies target, whether they are commercially available, and whether they are naturally occurring (not necessarily native) in NY.

A note about microorganisms as natural enemies

There are a few "natural enemies" on the above chart that are actually biopesticides, and I have listed them separately. Remember that microorganisms (fungi, bacteria, viruses) that are natural enemies of pests are biopesticides. A few of them can be found in the websites/apps summarized above. There are two compatibility questions when it comes to using biopesticides with living microorganisms as active ingredients: (1) Will this biopesticide harm other natural enemies (e.g., predators and parasitoids)? and (2) Will the living microbe in this biopesticide be killed by other pesticides I might use? The websites/apps described above have some information about the compatibility of biopesticides with arthropod natural enemies. If you're wondering about the compatibility of biopesticides with other pesticides, here are two places to look:

1. Read the label of the biopesticide. If it doesn't contain compatibility information (for use with other pesticides) or doesn't answer your questions about compatibility with other natural enemies, contact the manufacturer to get your questions answered.
2. If you happen to be using one of their products, BioWorks describes the compatibility of their products with other pesticides, and this information is linked to individual product pages.

And what about the bees?

Take a look at the resources created by the Pollinator Network @ Cornell. They have prepared decision-making guides for several crops already, with more to come.