

HOW TO SURVEY INSECTS ON YOUR FARM TO HELP MONITOR BIODIVERSITY

INSECT FACTS



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Yellow head bumble bee

There are almost 500 species of native pollinators in BC, the highest diversity in Canada!¹

Native pollinators are often more effective at pollinating crops than honeybees

~45% of the food produced annually is lost to pest infestations²

Honeybees, while not native to Canada, contribute \$538 million annually to B.C.'s economy through pollination³

Insects can be Helpful or Harmful

Insects can be harmful when they damage crops, or helpful when they pollinate crops and control pests. Helpful insects include pollinators, predators, and parasitoids. These insects can increase crop growth, raise yields and contribute to overall agroecosystem health.

Types of Helpful Insects

Pollinators like bumble bees, honey bees, and sweat bees pollinate many crops like blueberries, apples, squash, alfalfa, and tomatoes. Predators including ground beetles, spiders, hoverflies, ladybugs, and parasitoids control pests by consuming or parasitizing them. For example, hoverflies prey on aphid larvae while parasitoid wasps lay their eggs in pests, which hatch and then kill the pest. Other insects break down and recycle organic matter in the soil.

How do Insects Benefit Farms?

Pollinate crops



Control pests and diseases



Help clean up waste



How are Insects Detrimental to Farms?

Can damage crops



Can spread diseases



Click beetle

Insect Identification and Participatory Monitoring Resources

- **iNaturalist** (inaturalist.org): Smartphone app that can identify species from photos
- **Bumble Bee Watch** (bumblebeewatch.org): Smartphone app with bumble bee species descriptions and instructions to complete pollinator surveys
- **Beetle Watch** (scistarter.org/iue-beetle-watch): Provides ID guides for common ground beetle species
- **LeafByte** (zoegp.science/leafbyte): Measures leaf damage from smartphone photos
- **Caterpillars Count** (caterpillarscount.unc.edu/): Methods and app to quantify caterpillar abundance

How to Scout for Insect Pests

Adapted from *Michigan State University Bulletin E3294*



Scout for pests as soon as plants begin to grow — weekly scouting is often recommended until the crop is harvested or pest risk has passed.



Walk an X or W pattern in your field to assess pests and pest damage.



At 5 widely spaced points along your scouting pattern, check 10 plants and the surrounding area (~3 x 3m) for signs and symptoms of pests. Examine plant leaves, stems, roots, and flowers/fruits.



Identify pests and pest damage using field guides or smartphone apps. Record pest presence/severity and control measures used using a field map.

Other Simple and Common Techniques to Monitor Insects

1

Pan Traps

for pollinators

Shallow coloured pans of water can be used to attract and trap pollinators like bees and flies.

2

Sticky Traps

for pests

A coloured sticky card (usually yellow or blue) is used to trap and monitor pests.

3

Pitfall Traps

for beetles and spiders

Small cups with a cover are dug into the ground, level with the ground surface. Ground-dwelling insects, such as ground beetles and spiders, then fall into the trap.

4

Sweep Netting

for bees, butterflies, flying insects

A net is swept at a plant to capture flying insects such as pollinators (bees, hoverflies, and butterflies).

5

Beating Trays

for foliage-inhabiting pests and predators

A sheet or tray is placed under a plant before gently shaking the plant to dislodge insects onto the tray.

6

Sticky Pi Automated Insect Trap

for pests

A sticky trap is combined with an automated camera to capture insects and automatically identify which insect species has been captured.



Photo credits: Wolf Read and Juliana Cao

1. Native Bee Society of British Columbia. *Bee diversity in British Columbia*. <https://www.bcnativebees.org/bee-diversity>

2. Sharma, A., Kumar, V., Shahzad, B., Tanveer, M., Sidhu, G. P. S., Handa, N., Kohli, S. K., Yadav, P., Bali, A. S., Parihar, R. D., Dar, O. I., Singh, K., Jasrotia, S., Bakshi, P., Ramakrishnan, M., Kumar, S., Bhardwaj, R., & Thukral, A. K. (2019). Worldwide pesticide usage and its impacts on ecosystem. *SN Applied Sciences*.

3. Government of British Columbia. (2019, February 27). *Bees and bee health in British Columbia*. <https://news.gov.bc.ca/factsheets/bees-and-bee-health-in-british-columbia>

Funding for this research has been provided by: