

# What is Integrated Pest Management (IPM)?

Integrated Pest Management (IPM) is an environmentally sensitive approach to managing pests, which uses a combination of practices to control pest populations. The goal of IPM is to reduce pest damage through a holistic strategy that considers the entire farming system, including crops, pests, beneficial organisms, and management practices. The goal is to reduce the impact of crop production on soil, water and biodiversity.

## Key Principles of IPM

### 1. Planning and Prevention

- Recognizing the development stages of annual and perennial crops and knowing when and how to monitor each pest.
- Implementing practices aimed at reducing the chances of pest outbreaks (e.g. crop rotation, selecting pest-resistant varieties, and proper site selection).
- Managing soil fertility and ensuring good drainage also contribute to reducing pests by creating less favorable conditions (e.g. less weed pressure in a well-drained field with good pH).

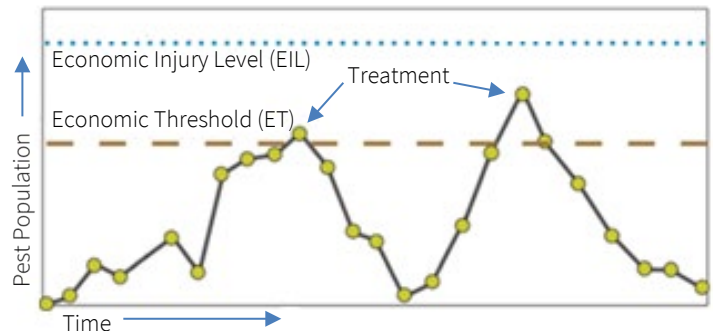
### 2. Monitoring and Identification

Regular monitoring is essential. Farmers need to keep an eye on pest populations and assess whether they are reaching levels that could cause economic harm to the crops (*Figure 1*). Monitoring techniques can include visual inspection, traps, or the use of technology, e.g. weather stations and forecasting models. Accurate pest identification is crucial to ensure that control methods target the pests and do not harm beneficial organisms.

### 3. Decision Making and Thresholds

Establishing economic thresholds (ET) is a central concept in IPM. The threshold indicates the pest population at which control actions are necessary to prevent significant crop loss. Using these thresholds avoid unnecessary pesticide applications by applying

treatments only when necessary and before pests reach an economic injury level (EIL).



*Figure 1:* The economic injury level (EIL) is the break-even point where management costs equal the damage caused by the pest. The economic threshold (ET) is the pest density at which control is initiated to prevent pest populations from reaching the EIL.

### 4. Implementation of Control Methods

IPM utilizes a variety of control methods classified into the following categories:

- **Cultural Control:** Crop rotations, intercropping, adjusting planting or harvest times, and using resistant crop varieties are practices to disrupt the pest life cycle and reduce pest populations.
- **Biological Control:** Using natural enemies, e.g. predators, parasites, and pathogens to manage pest populations, e.g. introducing ladybugs or parasitic wasps to control aphids and whiteflies.
- **Mechanical & Physical Control:** Using cultivation, traps or other barriers, e.g. row covers. These approaches are non-chemical and can be highly effective when pest levels are low.
- **Chemical Control:** While IPM encourages the reduction of chemical pesticides, they may still be used when other methods are not sufficient. IPM emphasizes the use of selective, less toxic pesticides and precise application techniques to minimize environmental impact.

### 5. Evaluation

Whatever control methods are utilized, the effects and efficacy of the management choices need to be evaluated. Consider the costs of monitoring, control

methods, and potential crop losses. Analyze the environmental effects of the program, including potential impacts on non-target organisms and compare pest population data over time to identify trends and assess the long-term effectiveness of the IPM program.

### Goals of an IPM Program

The goal of integrated pest management is not to completely eradicate the target pest. One of the key concepts of IPM is that the mere presence of a pest does not always indicate a problem. Pest management should bring the pest population numbers to levels where the losses, in quality and/or quantity due to the pest, are below economic injury levels. In other words, it is not recommended to act if the action is more expensive than the economic loss from the pest damage. Action should only be taken at critical periods, i.e. when pests surpass the economic threshold, or when a disease is forecasted, i.e. apple scab control before a rain event.

### Benefits of IPM for Farmers

IPM can help avoid crop loss by detecting pests early and preventing outbreaks. An integrated approach promotes ecological balance by protecting non-target organisms, preserving biodiversity and reducing pesticide resistance. Consumers are increasingly concerned about environmental impacts and pesticide residues. The implementation of IPM can help farmers produce crops that meet increasing consumer demands.

### Implementing an IPM Program

- **Develop a Pest Management Plan**

Create a pest management plan based on the specific needs of the farm. The plan should include crop(s) grown, pest monitoring methods, economic (action) thresholds and a list of control strategies. Support from a commodity specialist or pest management expert can help to develop the farm plan.

- **Education and Training**

Education is critical to successful implementation. Stay informed about the latest IPM techniques, pest identification and monitoring tools. Engage with

other farmers and take advantage of industry training events. Partner with researchers or pest management consultants to receive guidance on pest issues.

### Challenges of IPM

While IPM offers many benefits, implementation can sometimes be challenging. It requires a shift in mindset and adopting a more proactive, multi-faceted approach. Some challenges include:

- **Time:** IPM can require more time and effort for planning, monitoring, and implementing control strategies, which can be a limitation for some farmers based on available labour.
- **Financial Investment:** Some IPM tools, e.g. biological control agents and monitoring equipment, can require an initial investment. However, these costs are often offset by long-term savings and crop health benefits.
- **Knowledge and Expertise:** Understanding pests, their life cycles, and effective control measures require continuous learning. Farmers may need additional help to accurately identify pests and plan appropriate strategies.

The NSDA's [Environmental Stewardship and Climate Change Program](#) provides funding for physical anti-insect barriers (BMP 105); mechanical or physical weeding equipment (BMP 106), implementation of biosecurity measures to prevent the introduction of pests (BMP 107), mobile water tanks for spray applications (BMP 111) and insect and disease monitoring equipment, contractor fees for improved decision making (BMP 112) to help offset some of these challenges. Check [novascotia.ca/programs](http://novascotia.ca/programs) for the most recent funding information.

### References:

- [Perennia - Online Pest Management Guide](#)
- [NSECC – Integrated Pest Management](#)

### For more information:

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