

Integrated Pest Management

Biological Controls



Integrated Pest Management (IPM) is a comprehensive and environmentally conscious approach to pest control that prioritizes long-term prevention and minimal use of chemical treatments. It incorporates five key strategies—cultural, genetic, mechanical, biological, and chemical controls—to manage pests effectively in home landscapes. Each method contributes to a balanced ecosystem, reducing reliance on pesticides and promoting plant health. This article explores the fourth control method: biological control, which uses living organisms to manage pest populations naturally.

Biological Control: Nature's Pest Management

Biological control involves the use of beneficial organisms—such as predators, parasitoids, and pathogens—to reduce or eliminate pest populations. These natural enemies help maintain ecological balance and are an essential component of sustainable pest management.

Predators are insects or animals that consume multiple prey in their lifetimes. Common garden predators include lady beetles (ladybugs), which feed on aphids, mealybugs, and scale insects. Green lacewing larvae are another example; often called “aphid lions,” they prey on a variety of soft-bodied insects. Spiders, praying mantises, and predatory beetles also play vital roles in reducing pest numbers.

Parasitoids are insects, usually wasps or flies, that lay their eggs inside or on a host insect. When the eggs hatch, the developing larvae feed on the host, eventually killing it. For example, tiny braconid wasps lay their eggs in caterpillars like tomato hornworms. Gardeners can often spot parasitized hornworms covered with small white cocoons, a sign that biological control is already at work.

Pathogens include bacteria, fungi, and viruses that cause diseases in insect pests. One well-known example is *Bacillus thuringiensis* (Bt), a naturally occurring bacterium used as a biological insecticide. Bt targets the larvae of certain insects, such as caterpillars, while remaining harmless to humans, pets, and beneficial insects. Other microbial agents, like insect-killing fungi and nematodes, also help suppress pest populations when applied correctly.

Biological control is most effective when integrated with other IPM strategies. Providing habitat for beneficial insects—such as planting native flowers or avoiding broad-spectrum insecticides—helps encourage a self-sustaining population of natural enemies in the garden.

Looking Ahead: Chemical Control

While biological control offers natural, targeted solutions, there are situations where other methods may be necessary. In the next article in our IPM series, we'll examine **chemical control**—how to use pesticides responsibly, safely, and as a last resort within an IPM framework. Join us to learn how chemical treatments can complement an eco-friendly garden strategy.

Resources

[Oklahoma State University: IPM Issues](#)

[Plant Disease and Insect Diagnostic Laboratory](#)

[Insects, Pests and Diseases](#)

[Arthropod Pest Management in Greenhouses and Interiorscapes](#)

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