

Integrated Pest Management

Cultural and Genetic Controls



Integrated Pest Management (IPM) is a sustainable and environmentally friendly approach to managing pests in the home landscape. By combining multiple control methods, IPM reduces the need for chemical pesticides while maintaining plant health. The five main IPM controls—cultural, genetic, mechanical, biological, and chemical—work together to prevent and manage pest issues effectively. Cultural and genetic control are the foundation of IPM, as they focus on creating an environment that discourages pests from becoming a problem in the first place.

Cultural Control: Preventing Pests Through Proper Practices

Cultural control involves maintaining healthy plants and landscapes to minimize pest infestations. When plants are strong and thriving, they are better equipped to resist pests and recover from damage.

Consider these key aspects of cultural control:

- **Proper plant selection:** Selecting plants that are well-suited to the local climate (native, Oklahoma Proven) reduces stress and vulnerability to pests and disease. Crop rotation and interplanting different species can also help prevent pest populations from building up in one area.

- **Soil management:** Soil sampling to identify soil type and fertilization requirements, as well as selections accustomed to the type of soil. A well-maintained lawn, with proper mowing height and fertilization discourages weeds and pests such as grubs and chinch bugs.
- **Irrigation:** Overwatering and underwatering can weaken plants, making them more susceptible to disease and insect infestations.
- **Sanitation:** Removing plant debris and weeds eliminates hiding places for pests and disrupts their life cycle.

By implementing these strategies, homeowners create a landscape that naturally resists pests.

Genetic Control: Harnessing Plant Resistance

Genetic control involves using plant varieties that have been bred for resistance to pests and diseases. Many plants have natural defenses, such as thick leaf cuticles or chemical compounds that deter insects. By selecting pest-resistant varieties, gardeners can reduce the need for additional pest management methods.

Interestingly, host resistance to pests comes in different forms: antixenosis, antibiosis and tolerance.

Antixenosis occurs when the plant ceases to become a preferred host of the pest, and may also repel the pest. **Antibiosis** affects the pest's ability to thrive, may shorten its lifespan, or its ability to reproduce. And finally, **tolerance** forms stronger cultivars that are less susceptible than others, and that may still perform well even after sustaining damage from the pest.

For instance, certain tomato cultivars are resistant to common fungal diseases like Fusarium and Verticillium wilt. Some turfgrass varieties have resistance to chinch bugs, reducing the need for pesticide applications. Similarly, planting corn hybrids that are resistant to corn borers can significantly reduce pest damage in vegetable gardens. Utilizing genetically resistant plants is a proactive approach that strengthens the overall effectiveness of an IPM program.

Looking Ahead: Mechanical Control

Cultural and genetic controls lay the groundwork for a healthy landscape that is naturally resistant to pests. However, when infestations do occur, mechanical control methods can provide effective, non-chemical solutions.

In the next article, we will explore mechanical control techniques such as hand-picking pests, using traps, and employing physical barriers to protect plants from unwanted invaders. Stay tuned for practical tips on incorporating mechanical control into your IPM strategy!

Resources

[Oklahoma State University: IPM Issues](#)

[Plant Disease and Insect Diagnostic Laboratory](#)

[Insects, Pests and Diseases](#)

[OSU Fact Sheet AGEC-1059: Eleven Things to Know About GMOs](#)



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