



# HOW TO IMPLEMENT an Integrated Crop Management Strategy for Pest Prevention

NEW ADVANCEMENTS HAVE MADE IT EASIER THAN EVER TO DEVELOP A PEST PREVENTION PROGRAM FOR APHIDS, LEAFMINERS AND MITES. **By Marla Faver**

**P**est prevention is imperative for profitable plant production, and integrated crop management (ICM) is one of the best strategies to achieve it. Many growers find planning and implementing an ICM program can be daunting. However, with new advancements in technology and packaging as well as proper knowledge and planning, ICM is achievable for any grower.

## What kind of damage do these pests cause?

Before beginning an ICM program, it is important to understand the pests you want to control. Pests, such as aphids, leafminers and mites, can cause leaf distortion, virus transmission and possibly plant death. Plants damaged from pests are generally unsightly and of lesser value. Pest populations can develop very quickly, and once populations reach a particular threshold, it may be impossible to eliminate them. At that point, plants are damaged beyond repair.

## What is ICM and why does it matter?

ICM is a crop management strategy that integrates multiple control factors for long-term, sustained production, profitability and ecological soundness. In basic terms, ICM controls pests by using the best tools at the right time. By integrating your control tactics, including chemical and biological controls, ICM offers the following advantages:

- Complete pest control
- Combats pest resistance
- Increases employee productivity
- Enhances production efficiencies

## What is the first step toward implementing an ICM program?

ICM starts with crop monitoring. One of the basic tools of ICM is knowledge, which means knowing your crop inside and out. You should be keenly aware of what's going on in your greenhouse. This starts by collecting and documenting the following information, which will help determine the



*Two-spotted spider mite damage on New Guinea impatiens.*



**Left:** Yellow sticky card in poinsettia production.

**Right:** Aphids on terminal.



proper chemicals and biological control agents (BCAs) to use.

- Which pests present the biggest problem?
- What are your pest thresholds? What level of pests can you live with in your crop?
- What is your past experience with pest resistance?
- What is your past experience with disease and environmental issues?
- What is your crop cycle?
- What kind of growing system do you use?
- What are the environmental conditions?
- What is the crop stage of growth?
- What is the compatibility between the chemical products and biological control agents available?

Once you are well informed about the crop and cultural and environmental conditions, use the knowledge to begin an ICM program. The following steps will help you get started.

**1.** Sanitize the growing area. Remove all plant debris and weeds. Ensure algae are not growing inside the greenhouse or near plants. Don't forget to disinfect benches, floors and tools to prevent pests and diseases from entering the growing area.

**2.** Scout thoroughly and consistently for pests. Look for pests throughout the growing area. Do not assume that because there are no pests in one area of the greenhouse, there are no pests anywhere in the greenhouse. Remember to check undersides of leaves. Sticky cards are very useful scouting tools and should be evaluated weekly. Continue scouting throughout the growing season.

**3.** Apply preventive chemical treatments. When choosing chemical plant protection products, think about application rates, targeted pests and compatibility with other chemicals and biological control agents. Chemical applications help ensure growers start with a clean crop.

**4.** Consider including biological control agents for added pest prevention. Syngenta Bioline has a full line of beneficial predators and parasitoids, many of which have been tested for compatibility with chemical products. Table 1 provides



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general information about products and application timings. Use it as a guide to begin a leafminer, aphid or thrips ICM program.\*

### Start planning your ICM program today

Use the information to the right to begin an ICM strategy. Start by reviewing what you know about your growing space, and use that information to target problem pests and complement your specific conditions and needs. Make sure your greenhouse is properly sanitized, and coordinate a regular scouting routine. Plan your chemical and biological control applications and ensure they are compatible. At the end of the growing season, evaluate your ICM program and use what you learned to fine tune your plan for the next crop cycle.

ICM can be intimidating, but with the right tools, knowledge and professional advice, it is practical and achievable. Experts are available for consultation across the country from university researchers to Syngenta Bioline certified agents and sales representatives. Pest prevention is vital to profitable production, so don't wait until you see pests in your plants; develop an ICM strategy to ensure they never make it that far. 

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Integrated Crop Management with Bioline Biological Control Agents			
Pest Controlled	Assessment	Maintenance	Cleanup
<b>Spider Mites</b>	<b>Avid</b> miticide/insecticide • Initial insecticide treatment allows crop to start clean	<b>Phytoline p</b> biological control agent <i>Phytoseiulus persimilis</i> (predatory mite) • Release every two weeks. • Voracious predator and fast establishment in crop.	<b>Avid</b> miticide/insecticide • Apply as needed for rescue or cleanup treatment.
		<b>Anderline aa</b> biological control agent <i>Amblyseius andersoni</i> (predatory mite) • Release sachets preventively four weeks apart. • Performs in wide range of temperatures.	
		<b>Amblyline cal</b> biological control agent <i>Amblyseius californicus</i> (predatory mite) • Release every seven to 14 days. • Performs in hot and dry conditions.	
<b>Leafminers</b>	<b>Avid</b> miticide/insecticide • Initial insecticide treatment allows crop to start clean. • Targets leafminer larvae.	<b>Digline i</b> biological control agent <i>Diglyphus isaea</i> (predatory wasp) • Release preventively at dawn or dusk. • Release every seven days. Citation insect growth regulator • Apply every seven days for the first three weeks of Digline i establishment.	<b>Flagship 25WG</b> insecticide • Apply as needed for rescue or clean-up treatment.
<b>Aphids</b>	<b>Endeavor</b> insecticide • Apply every seven to 14 days depending on pest pressure.	<b>Aphiline ce</b> biological control agent mix <i>Aphidius colemani</i> + <i>Aphidius ervi</i> (parasitic wasps) • Release preventively. • Combination pack includes 50/50 mix that parasitizes large and small aphid species.	<b>Flagship</b> insecticide • Spray or drench for final cleanup application.
		<b>Aphidoline a</b> biological control agent <i>Aphidoletes aphidimyza</i> (gall-midge) • Release every seven days. • Preys on multiple aphid species.	

\*Results with any particular program will depend on many factors including time of year, number of applications, environmental conditions and specific products used. Releases of BCAs and chemical applications are based on particular scouting/monitoring programs. This is a general guide, and Syngenta Bioline cannot be held responsible for results that differ from these indications.