

Success story: Spanish greenhouse vegetables

Biocontrol on greenhouse vegetables in Almería, Spain



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Image: Gemena Communication via iStock

Overview

Who		Where	
Greenhouse vegetable growers		Almería, Spain	
Highlights			
<ul style="list-style-type: none">• Overuse of pesticides led to pest resistance and market rejection• Growers adopted biocontrol agents like <i>Encarsia formosa</i> and <i>Nesidiocoris tenuis</i>• Reduced pesticide use led to healthier crops and lower costs• Almería now leads Europe in Integrated Pest Management (IPM)			

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Almería, Spain, is one of the largest greenhouse production regions in the world. It exports tomatoes, peppers, cucumbers, and more, with approximately 3 million tonnes of produce grown each year. In the early 2000s, [the region relied heavily on broad-spectrum pesticides](#), which can kill multiple organisms. These pesticides included some classified as highly hazardous, meaning they posed a high risk to the environment and human health.

Pest problems in greenhouses

The enclosed nature of greenhouses makes them an ideal breeding ground for pests. The humid and warm temperatures also exacerbate or pest outbreaks. In Almería, chemical pesticides were traditionally used to tackle pest problems. However, the overuse of these pesticides led to resistance in key pests like *Bemisia tabaci* ([whitefly](#)) and *Tuta absoluta* ([tomato leafminer](#)), rendering these products useless. Additionally, the pesticides eliminated natural enemies, exacerbating the pest problem.

Export markets also began to reject produce with pesticide residues. Safety concerns regarding the health risks of these residues mean that markets often enforce maximum residue limits (MRLs) and reject produce that exceed these levels. This situation pushed growers to seek solutions that could overcome these challenges.

The shift to biocontrol

To address issues of pesticide resistance and residues, growers introduced biocontrol agents. These included *Encarsia formosa*, a parasitic wasp for whiteflies, and *Nesidiocoris tenuis*, a predator of leaf miners, whiteflies, and thrips. They also began using integrated pest management (IPM) practices such as sticky traps, physical barriers, and monitoring. Crucially, they reduced or eliminated the use of highly hazardous pesticides.

What this meant for greenhouse growers

Pest control in the region became more sustainable and cost-effective. Reducing reliance on pesticides allowed for a natural approach to pest management without building resistance or causing environmental harm. This helped lower input costs and increase yields. Additionally, Almería's produce is now marketed as residue-free, opening up premium export markets. Almería is now known to be one of Europe's leaders in Integrated Pest Management (IPM) adoption.



Whitefly scales (*Trialeurodes vaporariorum*) parasitized by *Encarsia formosa*. © Nigel Cattlin/Holt Studios International/FLPA

In summary

Biocontrol thrives when pesticides – particularly highly hazardous pesticides - are eliminated. In Almería, growers discovered that biocontrol agents could maintain effective pest control once natural enemies were safeguarded. This decreased the necessity for chemical interventions and enabled cost savings.

About the CABI BioProtection Portal

The CABI BioProtection Portal is the largest, free global resource for biological pest management. The Portal's mission is to raise awareness and encourage the adoption of bioprotection among growers and advisors. It offers a comprehensive, searchable directory of nationally registered biocontrol and biopesticide crop protection products, along with detailed guidance to help agricultural advisors and growers source and effectively incorporate these sustainable natural products into integrated pest management programmes.