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Biological Alliance

A greener way to produce healthier crops

By **Chris Hayes and Angel Marin**

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With increasing global demand for clean food, safe and without pesticide residues, producers in Latin America are working to keep up this demand and the practices used in the past are now reconsidered.

For decades, when it was necessary to control pests and diseases using chemical pesticides. The resistance management, reduced pesticide residues, human health and safety and environmental responsibility have challenged producers to consider biological pesticides or biopesticides, not only as alternatives to chemical pesticides, but in rotation with them.

Products biorracionales

Biopesticides provide food security and are available to pests and diseases, both in roots and foliage. They can be divided into two main groups - biotic (living) and abiotic (nonliving) - and both are used in major crops such as tomatoes, peppers, peppers, squash, strawberries, bananas and snuff among others.

In addition to resistance management, waste, health and safety for humans and environmental responsibility, producers seek to promote their products in organic markets, nationally and internationally.

Currently based biopesticides using bacteria and fungi. Its multiple modes of action (MOA) allow these microbes to block, eating, or restrict the growth and development of pests and diseases. Because of the many ways in which fungi and bacteria work, it is difficult to develop resistance over many generations. Certain species of the genus *Trichoderma* fungi can grow on the roots and take possession of root rot diseases (competition in the rhizosphere). A specific strain of *Trichoderma harzianum*, T-22, not only grows on the roots but attacks them rot oral (mycoparasitism), reducing the problems of root rot (Figure 1).

Certain strains of *Trichoderma* produce enzymes that drill holes in the cell wall of diseased root. Mycoparasitism Different strains produce different arrays of enzymes to control different root rot. The strains of the bacterium *Bacillus subtilis* mechanically produce compounds that damage cell membranes. Physical death by fungi along with mechanical death by bacteria differ from synthetic chemical death, offering alternatives for controlling root diseases. Benign fungi and bacteria also control bacterial spots caused by fungi and bacteria harmful. His death is MOA physics and mechanics.

Additionally, certain strains of the fungus *Beauveria bassiana* can be applied to the leaf surface or soil to control a range of insects. This beneficial fungus may annex the insect and within days it feeds on its host - a good example of biological warfare benign with little or no effect on non-target insects.

Biopesticides nonliving MOA also have multiple physical and mechanically to control pests and diseases. Bt toxins (toxic proteins from *Bacillus thuringiensis*) can cause ulcers in the insect. The bicarbonates, when formulated properly, can dry leaf spots, suppress insects and dry spores (Figure 2).



See in action video of a foliar fungicide potassium bicarbonate based on Powdery spores in: [www.bioworksinc.com / milstop-movie](http://www.bioworksinc.com/milstop-movie)

Visit the producers

During visits to several agricultural regions in Mexico and the Dominican Republic, I was pleasantly surprised that showed the commitment of producers as regards the use of products biorracionales. Some of them had established business relationships with U.S. and European buyers of organic food products (OMRI), others commented on her problems with resistance to chemicals that some pests and diseases were beginning to show. But all farmers interviewed shared their concern for the safety of their workers and the environment.

The beauty of the landscape in central Mexico, almost distracted me from my main purpose of visit to the producers of these lands.

The size and scope of the greenhouses in which tomatoes are produced, chilies and peppers, and even berries for the fresh market under conventional and organic methods, was impressive.

One of the largest producers of cherry tomatoes (cherry) in the greenhouse - who was recently honored with an award for sustainability - has been using biopesticides in their production. The producers of berries for conventional and organic markets also use biopesticides.

Basic Questions

Producers should ask three questions of their suppliers:

- 1) What is better biopesticide to tackle my problems with pests or diseases?
- 2) What environmental conditions favor the performance of biopesticides?
- 3) What other AGROINSUMOS could help or hurt the biopesticide?

Choosing the right biopesticide and understanding of compatibility, environmental and cultural, are important factors. Biopesticides recognized companies (which are part of BPIA, etc.), should offer advice on this and other issues that may pose food producer.

During the journey through the spectacular Dominican Republic with our distributors, both producers as consultants and researchers, all had similar questions to those of their counterparts in Mexico - biopesticides adequate and compatibility as well as costs. Many were pleased to know that these costs were comparable to those of synthetic products.

Conclusion

Belief and knowledge are two feelings that a food producer would have to employ a biopesticide. Organizations like BPIA and others are resources that producers interested in producing biorational can use to obtain information.

Producers in Latin America are using biopesticides and posing tough questions about efficiency, compatibility and cost. The right combination of accredited biopesticides can help producers to reduce use of synthetic agrochemicals, allowing, among other benefits, access to consumer markets greener.

For more information about this article, the authors write: Chris Hayes, Bioworks Inc., chayes@bioworksinc.com and Angel Marin, Plant Health Care in Mexico angel_marin@phcmexico.com.mx. To see two videos on biofungicide curative action on Powdery mildew spores, visit:

<http://www.bioworksinc.com/milstop-movie>

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