

Top 10 Reasons Why Biopesticides Should Be on a PCA's Pest Management Radar

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10. Because biopesticides are pesticides.

Isn't it all about knowing what tools are available in your arsenal? Like pesticides, biopesticides have the same purpose according to the EPA: They are a substance or mixture of substances intended for preventing, destroying, repelling or mitigating any pest. The difference is in the "bio." Biopesticides are derived from the natural materials from which they are produced, such as animals, plants, bacteria and certain minerals. In general, conventional pesticides are made of synthetic chemistry and biopesticides are not. But in the end, pesticides and biopesticides are the same in purpose—they are pesticides.

9. Because you are NOT responsible for any organic acres.

It's true. Approximately 95 percent of biopesticides are used on conventionally grown acres. Biological products are not just for organic growers. They have become key components for integrated approaches to conventional farming.

Biofungicides used to control soil-borne diseases in a wide variety of fruiting and leafy vegetables, potatoes, root crops, grapes, strawberries, tree fruit and nuts, are becoming the norm since they offer broad spectrum control, multiple modes of action and residual control. Sprayable *Bacillus thuringiensis* (Bt) bioinsecticides are another example. Bts have been used on fruit trees and other crops, both conventional and organic, for more than 50 years.

8. Because you ARE responsible for organic acres.

Biopesticides provide organic growers with pesticides they can use to control pests while remaining in compliance with their organic certification. There are many available. OMRI lists more than 3,500 products approved for use on organic acres, including hundreds of biopesticides.

Today most organic pome fruit producers use insecticidal viruses regularly to control codling moth and Oriental fruit moth. Crops found in the organic section of grocery stores regularly treated with biopesticides include anything from the proverbial apple to zucchini and everything in-between.

7. Because It's All About Mode of Action.

Yes, biopesticides are derived from natural substances. But the real payoff with biopesticides is in how those natural substances work to control the pest. Those modes of action offered in biomaterials are novel in comparison to those offered by synthetic chemical active ingredients and they provide us with many benefits: target-specific pest control (with minimal impact on non-target organisms, including beneficial insects), resistance management and environmentally safe profiles in the field.

The modes of action provided to us by biopesticides are many and unique. There are biological nematocides that contain naturally occurring fungus (*Paecilomyces lilacinus*) that parasitizes all stages of development of common plant-infecting nematodes. Another mode of action is infection—insecticidal viruses like *Cydia pomonella* GV and *Cydia pomonella* CpGV V-22 are used to infect and kill larvae of codling moth in pome and nut crops. *Paecilomyces fumosoroseus* is another fungus that infects whiteflies, aphids and other pests by germinating spores that penetrate the pest's cuticle causing death shortly thereafter.

Most biopesticides are created by nature with multiple modes of action. A biofungicide, *Bacillus amyloliquefaciens*, uses five modes of action against fungus and bacteria attacking plants. Its metabolites kill pathogens by disrupting cell membranes and cell walls, while in the plant it triggers an IR response, interacts hormonally through growth promotion and prevents infection by pathogens by competitive exclusion.

6. Because biopesticides are our most valuable resistance management tool.

Biopesticides are important for use in resistance management programs, because pests are not likely to develop resistance to biopesticides, and because biopesticides play a role in minimizing the development of resistance to other pesticides.

Because of their complex modes of action, biopesticides are not prone to resistance. And, because biopesticides offer multiple varieties of modes of action, it is less likely that resistant pest individuals will survive and create resistance pest populations.

We are facing the loss of many conventional products to reregistration and/or performance issues. Biopesticides are helping to fill the gaps. Further, the addition of biopesticides to a tank mix or rotation introduces unique modes of action that help foil the development of resistance to other pesticides thereby extending the useful life of those synthetic chemistries.

As more and more biopesticides enter the market, be sure to check FRAC (Fungicide Resistance Action Committee) categories carefully. New FRAC categories are being created, which gives you more application choices. The most recent example is the additions of the FRAC F6 category for *Bacillus mycoides* isolate J, a biological plant activator.

5. Because in many ways biopesticides make our jobs safer and easier.

For you, your grower customer and your growers' labor force, biopesticides offer a high degree of worker safety and production flexibility. Minimal PPE are normally required when using biopesticides.

In addition, the majority of biopesticides have high safety profiles that include low restricted-entry intervals (REI) for reentering fields for critical and essential operations. Most products also have low to zero pre-harvest intervals (PHI) that allow harvest crews to enter for timely harvests.

4. Because biopesticides offer export flexibility.

Most biopesticides are exempt from tolerance and have no specific Maximum Residue Limits (MRL) which allows maximum flexibility to a grower to export their crop, to meet a sudden spike in demand or pricing, and meet food processor and packer residue requirements.

3. Because biopesticides provide market differentiation and greater value to you and your employer.

For you or your employer, biopesticides build new business opportunities. More and more growers want to learn about biopesticides, and as their expert in the pest management arena, they want information from their Pest Control Adviser--you. PCAs that become the go-to source in their area for biopesticides are growing their businesses.

2. Because biopesticides are growing businesses.

Some biopesticides have a defined shelf life, require special storage and logistics or require less common techniques for application. PCAs have found that if a product delivers value to the grower, they can grow their business by being part of the solution and off value-added services. Some PCA businesses are prospering by offering specialized services, such as cold storage for *Paecilomyces fumosoroseus*, custom application services for *Gliocladium virens* GL-21, and additional field monitoring to accurately time applications for best results.

But the Best Reason to Be Up-to-Speed on Biopesticides is:

I. BECAUSE BIOPESTICIDES REPRESENT THE FUTURE OF PEST MANAGEMENT.

The biopesticide category is growing 14% to 17% annually. In 2015 the global biopesticide market was estimated at \$2.7 billion—between 2% to 6% of the approximately \$40 billion global pesticide market. It is expected that the biopesticide market will reach \$4.1 billion in 2018.

5 INDICATORS

of a Growing Biopesticide Market

1. 2015 Global Market estimated at \$2.7 billion (projected \$4.1 billion in 2018)
2. Less than 5% of Global Crop Protection Market
3. Dominated by USA/Canada (40% of global demand)
4. Europe fastest growing market
5. Conservative estimate of 14% to 17% annual increase

Source: BPIA

5 REASONS

Behind the Growth of Biopesticides

1. Increasing demand for green agricultural practices that are being met with biopesticides developed by dedicated, well-funded companies and individuals
2. The loss of many conventional products to reregistration and/or performance issues
3. Product development – more/better products that can compete with and complement conventional chemical pesticides
4. More applied research and on-farm demonstrations
5. Refinement of application rates and methods, better understanding of modes of action, and how best to use biopesticides in pest management and crop production programs

Source: BPIA