CONTEXT

FOCUS: CROP PROTECTION

Capturing Value with Safer, Effective, Sustainable Biopesticides

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Biopesticides saw a crescendo of business activity—product introductions, acquisitions and commercial alliances during 2009. The heightened interest and activity can be linked to an increasingly challenging regulatory environment for synthetics, paired with a strong desire for effective control products perceived to be safer for users, consumers and the environment.

Biopesticides are pesticides derived from natural materials (plants, animals or minerals). They fall into three major categories, two of which are included in this discussion (see below), as well as several subcategories:

Microbial	Bacterial
•Bacteria •Viruses •Fungi •Nematodes	•Plant growth regulators •Insect growth regulators •Plant/animal extracts (essential oils; venom) •Pheromones •Minerals (kaolin clay; sulfur)

Biopesticides are considered a crop protection niche' segment (organic or natural), and account for about 2% of the ~$33 Bn global pesticide market. In the past, they have suffered from the sometimes-deserved perception that they don't work very well. That's partly because the category is dominated by small to medium-sized companies, oftentimes start-up organizations. They understandably lack the financial heft to properly fund research, development and commercialization activities. What's more, the technologies inherently work more slowly or less completely than synthetics, leading conventional "dead bug now!" marketers to dub them sub-par.

One important positive for biopesticides: the cost of development and commercialization varies dramatically from synthetics. A biopesticide typically requires $10-20 Mn and about three years for development and global registration. A functionally similar synthetic may require up to 10 years and ~$200 Mn. That difference alone can justify a crop protection company's interest and investment. But the recent ~20% per annum growth rates, and recognition of the desirable benefits of biopesticides in conventional agriculture, make them truly worthy of renewed attention.

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Enlightened crop protection companies now are seeing biopesticides as partners rather than replacements for conventional chemistry. Ninety-five percent of biopesticide use today is said to be in conventional, rather than organic, production. In high-value conventional crop applications, the rotating-in of biopesticides can have an important role in resistance management, providing a completely different mode of action. Biopesticides typically have very favorable re-entry and pre-harvest intervals, contributing to improved management flexibility and crop quality with their use.

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The real value for major crop protection companies can come from combining biopesticides with synthetics in the same application. These new, low-impact combinations may qualify for Reduced Risk Pesticide status with the EPA. Biopesticides can be added to a conventional spray program to reduce the application of synthetics to their lowest label rate. This reduces the chemical load, maintains or improves efficacy, improves the safety profile, and effectively manages resistance.

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Pre-mixes of synthetics with botanical extracts or microbials can bolster patent strategies for popular synthetics approaching the end of protection. They also add value to generic chemistry. Importantly, integration of biopesticides into crop protection products can help support positioning of low-impact chemistries as more sustainable, eco-friendly, reduced risk options.

Majors are beginning to grow their investments in biopesticides. Dow AgroSciences has long had an interest in the category, first with spinosad insecticides and now spinetoram. BASF's licensing deal with AgraQuest for a biofungicide and Bayer Crop Protection's acquisition of select AgroGreen assets illustrate additional big company investment. Several others including Syngenta, Makhteshim Agan, FMC and Monsanto reportedly have development efforts underway through collaborations with smaller biopesticide firms.

Arysta Life Sciences provides a case in point. Its leadership recently announced EPA approval of its initial Responsive Pest Management Technology™ product ("Shooter™")--a pre-mix combination of an organic compound and a synthetic insecticide. Noted as an Eco-Responsive™ approach to pest control, RPM™ is positioned as a technology platform that will be the basis for future low-impact pesticide introductions.

The ag/food value chain must recognize and respond to the consumer demands for food perceived to be healthier, safer and more sustainable. Biopesticide development represents an important avenue for astute companies to address these marketplace conditions while providing value to growers and stakeholders.

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