

## Crop protection distributors' sales decrease during 2015

The US crop protection chemical industry experienced a 3.5% decrease among distributors at the cost of goods sold (COGS) level during 2015, according to the recently published report *Leading Distributors in the US Crop Protection Industry: A Strategic Market Analysis* by global management consulting and market research firm Kline. The report tracks the leading 20 distributors, which account for over 95% of the total sales of crop protection chemicals within the US. Total 2015 COGS at the distributor level are over \$10 billion. The 2015 crop protection industry began with challenging market conditions due to lower commodity prices and tight farmer economics, ultimately resulting in lower corn planted acres and affecting crop protection sales for most manufacturers of crop protection products. High inventories rolled over from the 2014 season forced distributors to provide incentives to growers. Notable acquisitions during the year include: Land O'Lakes (Winfield) and United Suppliers announced merger of their crop input businesses, Wilbur-Ellis acquired Lacey's Pharmacy, Triangle Chemical acquired Cardinal Chemicals and Pinnacle acquired three agricultural retailers. The report indicates the US crop protection industry as mature yet dynamic on a year-to-year basis with plenty of business opportunities for companies within the distribution channel willing to take educated risks. Market drivers identified within the agricultural distribution channel include: improving efficiencies, managing new regulations, customer relationships, and adopting new streams of revenue. (For more information: Kline & Company, website: <http://www.klinegroup.com>)

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## Monsanto Growth Ventures announces first investment portfolio

Monsanto Growth Ventures (MGV), the venture capital arm of Monsanto Company, has announced for the first time its growing investment portfolio. This covers nearly a dozen independent companies that are active in key areas of agricultural productivity, digital agri-

culture and biologicals. Arvegenix is a St Louis, MO, company transforming field pennycress into a commercially viable cover crop service, while also producing an energy and feed crop. Nimbus-Ceres is a jointly owned entity with Nimbus Therapeutics in Cambridge, MA, to co-develop agricultural fungicides. AgSolver, based in Ames, IA, develops software and analytic systems for supporting more sustainable land management, valuation and business planning. Vital Fields, based in Tallinn, Estonia, is a company with the simplest farm management system in the business, and helps European growers maximise their farm efficiencies. The company manages everything from field books to compliance to farm activities, and will be providing farm analytics to help growers make data-driven decisions. HydroBio provides prescriptive irrigation recommendations by creating a layered data product via a mobile platform, to conserve water and increase yields. It is focused on irrigated acres of major row crops, and has helped Monsanto reduce its water footprint for seed production. The company is based in Denver, CO. On the forefront of robotic farming, Blue River Technology in Sunnyvale, CA, uses computer vision and machine learning for precision weeding and the application of herbicides. Based in Cambridge, MA, Preceres accesses technology from MIT to develop delivery agents to support the development of biological solutions for farmers. Preceres possesses a large diverse chemical library of 2300 plus compounds/biomaterials. AgBiome discovers and develops biologicals, traits and innovative biofungicide products that it commercialises directly and through partnerships. The company is headquartered in Research Triangle Park, NC. Cambridge, MA-based RaNA Therapeutics develops RNA-targeted molecules that selectively target protein expression. PivotBio is an Emeryville, CA, company focused on innovation rooted in the crop microbiome. Pivot is improving agricultural microbial strains to increase crop productivity. Based in Madrid, Spain, Plant Response Biotech offers a promising pipeline of natural products and microbes for crop health and yield that deliver more value to the grower around biotic and abiotic stress tolerance. (For more information:

Monsanto Co, 800 N Lindbergh Boulevard, St Louis, MO 63167, USA; Tel: +1 314 694 1000; Website: <http://www.monsanto.com>)

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## Sumitomo Chemical and BASF to develop new cultured cells for safety evaluation of chemicals

BASF and Sumitomo Chemical will collaborate on research into a more sustainable, *in vitro* system for chemical safety evaluation. Recent years have seen an increase in stringent regulations for registration of cosmetics ingredients, agricultural chemicals and pharmaceuticals, and the demand to increase human relevance of safety studies. For these reasons, Sumitomo Chemical and BASF aim to create a system that supports the development of safe chemicals, while reducing the need for conventional animal testing. As the first step in their research, Sumitomo Chemical and BASF aim to establish a new line of fully functional cultured cells to enable the safety evaluation of chemicals in a more efficient and more precise way than conventional methods. (For more information: BASF SE, D-67056 Ludwigshafen, Germany; Tel: +49 (0) 621 600; Website: <http://www.basf.com>)

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## Monsanto takes action to fight climate change with carbon neutral crop production programme

Monsanto Company has announced plans to make its operations carbon neutral by 2021 through a unique program targeted across its seed and crop protection operations, as well as through collaboration with farmers. Monsanto will drive carbon neutral crop production in its own seed production operations by leveraging diverse products and agronomic approaches (eg breeding, plant biotechnology, data science, conservation tillage, cover cropping systems), with the goal of eliminating that portion of its carbon footprint altogether. Working with outside experts in data science on extensive modelling, Monsanto has shown that utilising these practices and innovations can make an important difference, allowing corn and soybeans to be

grown such that soil absorbs and holds greenhouse gases equal to or greater than the total amount emitted from growing those crops. The company also will work with farmers to promote and drive the increased adoption of these carbon neutral crop production methods. The company also is targeting its crop protection business to be carbon neutral by 2021. To offset the remainder of its crop protection and other non-seed production operations, Monsanto is working to develop a program to provide incentives to farmer customers who adopt carbon neutral crop production methods, in exchange for part of their carbon reduction value. Monsanto will use those reductions as offsets to neutralise its remaining carbon footprint. Monsanto has developed the carbon neutral crop models with the help of external experts and will share their data and modelling results with the broader agriculture, climate modelling and other communities to help drive the adoption of best practices and to reinforce the role crops can play in reducing carbon emissions. To date, these models are focused on the US Corn Belt, where the most accurate data on crop yields, soil types, crop rotations and best management practices are publicly available. The models indicate that high yielding, carbon neutral corn and soybean production, in the US alone, has the potential to reduce crop production emissions equivalent to 100 M metric tonnes of carbon dioxide, which is equal to reducing 233 M barrels/y of oil consumption. (For more information: Monsanto Co, 800 N Lindbergh Boulevard, St Louis, MO 63167, USA; Tel: +1 314 694 1000; Website: <http://www.monsanto.com>) **CBNB**

### *Biorationals*

#### **Biopesticide companies set for consolidation amid growth**

The Biocontrol Industry is a projected to generate about \$2 billion in sales in 2016, according to Dunham Trimmer, and it is trending toward continued strong growth for the foreseeable future. The research firm expects the segment's market share to double by 2020. Biopesticides constitute an estimated \$1.3 billion to \$1.6 billion of the segment, making it the largest subsector by far.

Microbials and biochemical products have been adopted at the greatest rate, finding footing in the early years on vegetable crops and in glasshouse operations. These products are expected to experience double-digit growth rates in nearly all countries through 2020, according to Kline, a research consultancy. The main driver behind current growth of biopesticides is the development of microbial seed treatments on field crops, including corn, soybeans, and cotton. Microbials are growing faster due to the high use in field crop seed treatment. The field crop use of biopesticides has grown from a barely measurable position to the leading segment in end-user value in the past decade, now accounting for approximately 34% of the total biopesticide market, according to a report by Kline. Vegetables rank second. Rapid consolidation will continue in the biopesticide space as companies try to right-size R&D operations with the market. Like any emerging advancement in biological science, strong investments into research lay the foundation for new discoveries and new products. Now the sector will try to consolidate its disparate and in many cases proprietary discovery and development infrastructure so products can reach the market in more timely and affordable ways. In a recent Kline survey across nine countries, more than 150 companies showed measurable market shares, and the top 48 companies accounted for just 60% of the biopesticide market, illustrating the fragmentation of segment and in many cases the specialisation of company technology. Distribution will continue to drive M&A activity. The not-too-distant acquisitions by large traditional crop protection companies were in part driven by the need for biopesticide products to access various markets and enter a predictable value chain. Distribution is a struggle for the sector because of the nature of the product. Handling requirements are exact, and so is the application timing for the end user. This reality requires that product education follow the products through the value chain, infrastructure already established by traditional crop protection product distribution. Bayer, with its acquisition of AgraQuest in 2012, is the largest biopesticide company in the world, according to Kline, followed by Sumitomo subsidiary Valent BioSciences, and BASF following its 2012 acquisition

of Becker Underwood. Bayer Vice President of Global Marketing Ashish Malik told attendees at ABIM that biocontrols could represent a new green revolution by understanding how biological products interact with plants. Malik said he expects the industry to grow during the next 10 years as farmers continue to demand more integrated solutions and programs, and there is a potential market in nearly every crop in every country around the world. Regulatory issues continue to hamper product introductions as well. Although many countries provide a fast-track process for biological products, highly regulated markets are still on their heels. Notably, the EU and Brazil continue to treat biopesticides like conventional chemistries during the registration process. Though the European Commission's 1107/2009 regulation does not permit fast-track registration for biocontrol products, there is good news on the horizon as the European Commission is planning its routine re-evaluation of the regulation with an emphasis on creating more favorable framework for biocontrol products, according to Wolfgang Reinert, head of the EC's Directorate for Health and Food Safety. The re-evaluation is expected to take place in early 2016.

#### **Biological nematicides settling in the global specialty pesticides market**

The emergence of field crops as a fast-growing segment with biological nematicides as the quickest growing control method is the overriding trend from 2009 to the present. Since 2009, the market has grown nearly 20%, with most of the growth in field crops and biological products occurring in the United States, according to the recently published *Nematicide Market: Global Market Analysis and Opportunities* report from global market research and management consulting firm Kline & Company. The third edition of Kline's Specialty Pesticides research reports that sales of nematicides total just over \$1 billion in 2014 and are expected to grow at a compound annual growth rate (CAGR) of 2.7% in the next 10 years to reach \$1.3 billion in 2024. Consuming over 70% of the global market, the three leading country markets are the US, Brazil, and Japan.

Speciality crops, field crops, and vegetables are the largest crop segments, each containing sales of over \$250 M. Dow AgroSciences and the combination of Monsanto and Bayer marketing Bayer's Votivo - a biological nematicide - are the two leading companies in the global nematicides market in 2014. In terms of sales value, chemical nematicides continue to be the largest product type used in 2014; however, the use of chemicals has dramatically decreased since 2011. Fumigants dropped off as well to give way to increasingly popular biologicals. Nematicide seed treatments are expected to continue to be used on a spectrum of field crops which ties in with the trend to protect higher value seeds that are engineered with new traits. In high value produce crops, the desire to analyse the need for insect, weed, and disease protection will result in innovative solutions. Biological nematicides have grown tenfold during recent years, driven by the robust performance of *Bacillus firmus*. This strain of bacterium is labelled for seed treatment of corn, cotton, soybeans, and sugar beets, accounting for over 80% of the biological nematicide sales. (For more information: Kline & Company, website: <http://www.klinegroup.com>) **CBNB**

### The BioAg Alliance readies new microbial solution to improve corn harvests

The BioAg Alliance, Novozymes' and Monsanto's collaboration to improve crop harvests through naturally-occurring microbes, has announced results from its 2015 field trial program. Those results included a corn inoculant product, which increased yields by an average of 4 bushels per acre in US field tests. The product is based on a fungus found in soil and researchers from the two companies have found a way to coat the microbes on corn seeds without harming the microbes' performance or longevity. The alliance plans to launch the new solution in the US in 2017. The BioAg Alliance expects to continue testing thousands of strains across a broad range of environments in extensive US field trials in 2016. The BioAg Alliance's

products are used on around 65 M acres, but Monsanto and Novozymes envision that their products will be used on 250-500 M acres globally by 2025. The agricultural market for microbials is estimated at \$1.8 billion, while the market for traditional fertilisers and pesticides totals \$240 billion. (For more information: Monsanto Co, 800 N Lindbergh Boulevard, St Louis, MO 63167, USA; Tel: +1 314 694 1000; Website: <http://www.monsanto.com>) **CBNB**

### Biochar market size to reach \$5.89 billion by 2022

The global biochar market is expected to reach \$5.88 billion by 2022, according to a new report by Grand View Research Inc. Rising consumption of the product in agricultural operations owing to its soil amending abilities will stimulate industry expansion over the forecast period. Increasing agricultural productivity and crop yield is expected to augment market growth over the next seven years. **CBNB**

#### Formulation

### Priostar to improve agrochemical formulation

In recent months, a number of new agreements have been signed or extended with major agrochemical companies for the European, Asian and North American markets. Most recently, a Priostar collaboration was signed with a major Japanese agrochemical company. In addition, licence negotiations are underway for rights to Priostar to enhance a number of existing agrochemical products. Recent regulatory compliant field trials on Priostar enhanced versions of several major herbicide and fungicide formulations showed commercially compelling product benefits, including improved effectiveness and faster onset of action. In addition, Starpharma has recently developed more environmentally friendly formulations of major herbicides and insecticides using Priostar technology, which are now the subject of commercial discussions. (For more information: <http://www.starpharma.com/>) **CBNB**

### Effects of nanoparticles on germination of various lentil seeds studied in Iran

Iranian researchers studied the effect of silicon nanoparticles on the germination of various types of lentil which can improve the crop's stabilisation in the early germination stage in arid and semi-arid regions. **CBNB**

#### Seed treatments

### China's 2015 seed treatment market up 17%

In 2015, China's seed treatment sales reached 2.86 billion yuan (\$435.3 million), up 16.7% compared with 2014. The market is expected to reach 3.5 billion yuan (\$532.7 million) in 2016 and exceed 5 billion yuan (\$760.8 million) in 2019, according to the China Crop Protection Industry Association (CCPIA). In terms of crops, the proportion of the seed treatment applied to wheat, maize and cotton is 38%, 32% and 16% respectively. In addition, the proportion of the seed treatment applied to rice, soybean and peanut is 5%, 4% and 4% respectively, CCPIA said.

#### Public health

### New two-way insecticide mixture for indoor residual spraying

Bayer has submitted a dossier to the World Health Organization Pesticide Evaluation Scheme (WHOPES) to assess its new two-way insecticide Fludora Fusion (deltamethrin plus clothianidin), which employs a novel mode-of-action for indoor residual spraying to control disease vectors. The product aims to support Africa's disease control programmes by offering a solution to insecticide-resistant mosquitoes that transmit malaria. The WHOPES evaluation is expected to last for around two years and Bayer expects to launch the product by end-2017. **CBNB**

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