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international news, comments, features and conference reports

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LEAD ARTICLES

CEO TO LEAVE BAYER CROPSCIENCE

The big news of last month was the announcement that Bayer CropSciences' CEO is to leave the business. Sandra E Peterson has asked for her contract, which runs until summer 2013, to be terminated at the end of November. She is to join Johnson & Johnson (J&J) to fill the newly created role of group worldwide chairwoman. Her appointment, effective 1 December, is part of J&J CEO Alex Gorksy's efforts to resolve issues at the company's troubled consumer health and manufacturing operations. In her new role, Ms Peterson will be responsible for information technology, and the global supply chain in addition to J&J's vast consumer business, which makes products including *Tylenol*, baby shampoo and *Band-Aids*.

Ms Peterson, at present the chairman and CEO of Bayer CropScience, is currently based in Europe. She has a BA in Government and a Master of Public Administration in Applied Economics, and started her career as a management consultant at McKinsey & Company. She went on to hold various global executive positions with American home appliances manufacturer Whirlpool Corporation, subsequently being appointed Executive Vice President at foods company Nabisco. After that she became Senior Vice President of Merck-Medco's Health Businesses.

Dr Marijn Dekkers, CEO of Bayer AG said: "With her experience and commitment, Sandi has made significant contributions to the strong business performance of Bayer CropScience in the past two years. However, we accept her decision to continue her career back in the US, her home country and wish her all the best for the future." Ms Peterson became CEO of Bayer CropScience on 1 October 2010. Before moving to Bayer CropScience, she was a member of the Executive Committee of Bayer HealthCare from May 2005 and headed up the Medical Care Division from January 2009. There is no news about her replacement.

MAJORS CONTINUE TO INVEST IN BIOPESTICIDES

The other important news in September was the continuing investment by the majors in biopesticides, all hoping to get a significant foothold in this growing market sector. Following Bayer's recent acquisition of the biopesticide manufacturer AgraQuest for around $500 million (*June CPM*) both Syngenta and BASF have announced similar investments. BASF plans to acquire Becker Underwood, a producer of seed applied biologicals for $1.02 billion while Syngenta is acquiring Pasteuria Bioscience. Industry experts say this increased interest is likely to encourage more research and investment in the industry which is expected to triple its value to almost $4 billion by 2020.

Syngenta and US-based Pasteuria have had an exclusive global technology partnership since 2011. It was set up to develop and commercialise biological products to control plant-parasitic nematodes, using the naturally occurring soil bacteria *Pasteuria* spp. A revolutionary in-vitro production process will enable the development of cost-effective nematicides with a novel mode of action. The first product will be a seed treatment for soybean cyst nematode to be launched in the US in 2014. Under the terms of the agreement, Syngenta will acquire Pasteuria Bioscience for aggregate payments of $86 million, with additional deferred payments of up to $27 million.

Nematodes are a major pest across all crops and the withdrawal of older products leaves growers with limited solutions. The acquisition will facilitate the introduction of key products to complement Syngenta's existing chemical nematicide range and to support integrated solutions across a broad variety of crops such as soybean, corn, cereals, sugar beet and vegetables. John Atkin, COO of Syngenta (EAME and Latin America), said: "Results from our partnership have shown that *Pasteuria* provides superior control of nematodes in a wide variety of applications. Pasteuria Bioscience has developed critical knowhow for in-vitro production of *Pasteuria*, enabling commercial scale manufacturing. This is a further example of our strategy of incorporating biological controls within our integrated offer to growers". The transaction is expected to close in the fourth quarter of 2012.

Becker Underwood, based in Ames, Iowa, US is one of the leading global providers of technologies for biological seed treatment, seed treatment colours and polymers, as well as products in the areas of biological crop protection, turf and horticulture, animal nutrition and landscape colorants and coatings. The company has 10 production sites worldwide and 479 employees. The purchase is subject to

approval by the responsible authorities and legal closing of the transaction is expected by the end of 2012.

“We are impressed with Becker Underwood’s ability to translate growers’ needs into innovative, tailor-made solutions that can promote higher yields while conserving resources. Becker Underwood is to become part of BASF and we are excited that together with our new colleagues we can continue expanding our competencies. Particularly in the rapidly-growing seed treatment market, we will be able to develop innovative solutions for agriculture,” said Dr Andreas Kreimeyer, research executive director and member of BASF’s board of executive directors responsible for the Agricultural Solutions segment.

Becker Underwood is expected to achieve sales of $240 million for fiscal year 2012, ending on 30 September. As part of the acquisition, BASF’s Crop Protection division will create a strategic global business unit called Functional Crop Care. The unit will merge BASF’s existing research, development and marketing activities in the areas of seed treatment, biological crop protection, plant health, as well as water and resource management with those of Becker Underwood. Becker Underwood’s animal nutrition business will be integrated into BASF’s Nutrition & Health division.

EUROPEAN NEWS AND MARKETS

SYNGENTA INVESTS IN RUSSIA

In conjunction with the Governor of Krasnodarskiy Krai, Russia, Syngenta has signed a Letter of Intent to invest up to $85 million in the construction of a hybrid seed and crop protection production facility. John Atkin, Syngenta COO, said: "Technology will play a key role in realising Russia's ambition to intensify its agriculture sustainably. This also represents a significant economic opportunity for Russian farmers. It is therefore vital that they have access to high quality crop protection products and hybrid seeds. Our intended investment will enable local production of these key inputs."

Subject to obtaining the necessary local permits and approvals, Syngenta expects to commence production of hybrid seed in 2015 and of crop protection products in 2016. "This announcement underlines our long-term commitment to Russian agriculture. We are pleased to be working closely with the authorities in Krasnodarskiy Krai, which is a region at the forefront of the sustainable development of agriculture in Russia," Mr Atkin concluded.

SUMITOMO CHEMICALS TO LAUNCH FENPYRAZAMINE IN ITALY

Sumitomo Chemical has developed a new fungicide, *Prolectus*, for control of diseases such as gray mould (*Botrytis cinerea*) and sclerotinia rot (*Sclerotinia sclerotiorum*) and Monilinia (*Monilinia* spp) in grapevines, stone fruit trees and vegetables and will launch the product in Italy this autumn through its group company Sumitomo Chemical Italia. *Prolectus* contains a novel active ingredient fenpyrazamine, discovered by the company's own research. The active rapidly penetrates crops providing an immediate effect on fungal infections. In addition, fenpyrazamine has good mammalian safety and lower persistency in the environment. It can, therefore, be used for a wide variety of crops until just before their harvest.

Sumitomo Chemical is actively working towards registering and launching fenpyrazamine-containing products globally. The company has already applied for registration of *Prolectus* in most of the EU member states including France, Spain, UK, Austria and Germany with the aim of expanding sales of the product across the EU by 2015. In Asia, an approval has already been obtained in South Korea where sales will begin in 2013. Application for registration has been made in Japan under the product name of *Pixio DF*. In the future Sumitomo Chemical plans to obtain approval of the fungicide in South Africa, Australia, Brazil, Chile and the US.

WHEAT STUDY HIGHLIGHTS THE IMPORTANCE OF TRIAZOLE FUNGICIDES

A recent study conducted by Nomisma (**www.nomisma.it**), a well-known Italian economic research institute, has shown that the economic relevance of azole fungicides in the EU is considerable. European cereal fungicide programmes rely on triazole based solutions as the effectiveness of alternative treatments have become largely ineffective on Septoria which had developed resistance. Triazole based fungicides have been the backbone in providing a more resilient defence against Septoria, but they are also vulnerable to the threat of resistance.

Projections show that, with azoles still in use, wheat yield and cultivated areas would continue to increase in the next few years, resulting in an overall growth of wheat production that has been estimated at +5.0% in 2013 and +13.4% in 2020. According to these trends, the EU would remain a net exporter of wheat and would continue to produce more wheat than is being consumed. The yield of wheat would decrease if the use of azoles ceased resulting in a loss of production of 9.8 million tons in 2013 (from 141.1 to 131.3) and 18.6 millions of tons in 2020 (from 152.4 to 133.8). This decreasing production would not only mean a loss of value of €2.4 billion in 2013 and €4.6 billion in 2020. It would also mean that the EU would be unable to satisfy its internal demand and remain self-sufficient.

DUPONT SUPPORTS EFSA'S CALL FOR A POTATO NEMATODE SURVEY

Dr Wilbert Flier, DuPont's nematicide product development manager in Europe, Middle East and Africa, backs the call made in April by the European Food Safety Authority (EFSA) Panel on Plant Health for an EU-wide survey to determine the distribution of the nematodes *Globodera rostochiensis* and *Globodera pallida*. The EFSA review indicates that sustainable potato production across the EU could be under threat from potato cyst nematodes (PCN) and free living nematodes (FLN) without a comprehensive review of sampling and management options. DuPont, who market the nematicide *Vydate* (oxamyl), are also encouraging member states to adopt a full IPM approach.

The EFSA report concludes that almost a century after they were first reported both PCN species have become well established within the EU. *G. rostochiensis* is present in all EU member states, whereas *G. pallida* is found in all with the exception of Denmark, Estonia, Latvia, Lithuania and Slovakia. Dr Flier commented: "ESFA's report has highlighted problems with the current control measures to reduce the spread of PCN within the EU, and it is widely accepted that FLN are present in most agricultural soils. He further added that the official bodies of each of the member states must take responsibility for the adoption of the correct strategies for the control of PCN and FLN as the quality and yield of potato crops are not sustainable in the presence of large populations of plant parasitic nematodes.

According to Dr Flier responsible IPM practices should embrace consistent soil sampling to correctly identify nematode species and population levels, extending rotations, cultural measures such as growing tolerant and/or resistant cultivars and, where appropriate, responsible use of nematicides, to ensure continued and sustainable potato production. He also recognises that the strategy of only producing seed potatoes in fields free from PCN remains in force. However, in some countries growers are not permitted to grow commercial ware potatoes in fields where nematodes have been identified. Dr Flier suggested that, provided full IPM is adopted, some relaxation of these rules should be considered. Currently he believes that these rules can dissuade growers from soil sampling, which in certain situations can make an existing nematode problem much worse."

GRAIN APHIDS RESISTANCE TO PYRETHROIDS GROWS

Research work at Rothamsted Research, funded by a consortium consisting of the UK's Chemical Regulations Directorate (CRD), the Department of Environment, Food and Rural Affairs (Defra), agrochemical companies and grower financed Levy boards, suggests that grain aphids, *Sitobion avenae*, in the UK are becoming more resistant to pyrethroid insecticides. The increased resistance may be due to the number of grain aphids carrying the knock-down resistance (kdr) mechanism which has increased in frequency this year. Grain aphids are a potential vector of the damaging barley yellow dwarf virus (BYDV) in cereals.

Research leader Dr Steve Foster said: "Our research does give us cause for concern but we should not panic just yet because BYDV is also transmitted by the bird cherry-oat aphid which is a more important vector and there's no sign of kdr in this aphid yet". He recommends that when grain aphids are the main pest present then growers need to be aware that pyrethroid sprays may not be fully effective. He advocates switching to an insecticide with an alternative mode of action if timely application with full dose of pyrethroid-based product does not prove effective. Professor Lin Field, head of the Biological Chemistry and Crop Protection Department at Rothamsted Research stressed: "We should not take our eye off the ball; the threat of pyrethroid resistance is very real and we need to continue researching to establish how potent this resistance is and whether pyrethroids will work in the future."

EU'S CAP WILL NOT BE COMPLETED BY 2014 DEADLINE

European Agriculture Commissioner Dacian Cioloş acknowledged that reform of the EU's Common Agricultural Policy (CAP) will not be completed by the 2014 deadline. He told a meeting of government and industry leaders that many key reforms will not come into effect until 2015 and urged them to think of 2014 as a "transitional" changeover period.

Some concessions to the farming lobby on the controversial subject of 'greening measures' were announced. Under the current proposals, 7% of land will be taken out of production and set aside. Commissioner Cioloş indicated that the set aside could be organised on a group or parish basis, and not limited to a single holding. He also suggested that ineligible land could count towards the set aside area which would reduce the impact on production. Farming industry representatives were reported to have welcomed the announcements, which they considered a move "towards greater flexibility."

Cioloş stated that he wanted to ensure measures are implemented equally throughout Europe, reiterating that greening measures are the result of a desire for greater environmental and social consideration in the CAP on the part of the European public. He dismissed the call made by the farming unions in some member states to be able to choose suitable environmental measures from a list of options, as applies with existing stewardship schemes. Further progress on the policy reforms will not be made until finance ministers have agreed on a budget for the policy later this year. Progress

is not now expected until January at the earliest. The commissioner said he remains hopeful that a deal on the CAP will be negotiated in early 2013, during the Irish presidency of the EU.

SCIENTISTS REJECT GM RAT STUDY

What has been claimed to be the first peer reviewed paper showing the potential health risk from consuming GM food was published on 19 September. The paper written by Séralini et al, University of Caen, France was published in *Food and Chemical Toxicology*. It claims that in lifetime feeding studies, rats fed on a diet containing NK603 Roundup-tolerant GM maize, or given water containing *Roundup*, died earlier than rats fed on a standard diet, suffering mammary tumours and severe liver and kidney damage. The paper was heralded by NGOs and organisations known to be concerned about the risks associated with GM foods as proof of the health hazard. Now the European Food Safety Authority (EFSA) has criticised the study for selecting tumour-prone test rats, and for failing to obey key international research protocol. EFSA concluded that the study's concerns about maize NK603 and the herbicide were of insufficient scientific quality to be considered as valid for risk assessment. They found that the design, reporting, and analysis of the study by the French researchers were inadequate. EFSA has invited the paper's authors to share key additional information before it can declare the study as "scientifically sound".

Per Bergman, who led EFSA's work, said: "Some may be surprised that EFSA's statement focuses on the methodology of this study rather than its outcomes; however, this goes to the very heart of the matter. "When conducting a study it is crucial to ensure a proper framework is in place. Having clear objectives and the correct design and methodology create a solid base from which accurate data and valid conclusions can follow. Without these elements a study is unlikely to be reliable and valid." Mr Séralini and his team say their experiment in GM food is the first to follow rats through their lifespan, as opposed to just 90 days, but other, non-EFSA experts have also questioned its methodology, results, and relevance to humans.

Dr Mark Downs, chief executive of the Society of Biology said: "Studies to assess the safety of food for human and animal consumption are extremely important. However, it is difficult to draw any conclusions from the data in this study and the results need to be considered alongside the accumulated evidence on the safety of herbicides and GM plants." Professor Alan Boobis, Professor of Biochemical Pharmacology, Imperial College London said: "Some of the effects are presented in a way that makes it difficult to evaluate their significance. For example, there does not appear to be a statistical analysis of the mammary tumours. These occur quite often in [30% of] untreated animals. One would usually also take into account the historical controls in the testing lab, in reaching a conclusion. The pesticide itself has been subject to long term studies in rodents by others."

AMERICAN NEWS AND MARKETS

BASF RECEIVES EPA REGISTRATION FOR ZAMPRO

BASF has received US EPA registration for a new fungicide *Zampro* for use on vegetables, grapes, potatoes and hops. “With its new chemical class, this fungicide offers an excellent tool for successful resistance management,” said Katherine Walker, BASF technical service representative. “It’s effective, easy to use, and will help ensure reliable crop quality and yield – and thus will be adding to growers’ confidence and convenience.” *Zampro* fungicide is a premix combination of ametoctradin, a new mode of action, and dimethomorph. The multi-site fungicide is designed specifically to protect crops against oomycete diseases such as downy mildews, *Phytophthora infestans* and *Phytophthora capsici*. It can be applied at a maximum of three applications per season with no more than two consecutive applications. Best results are achieved with *Zampro* applied preventatively.

RULING ON HERBICIDE TECHNOLOGY SIDES WIITH DOW

A lawsuit, filed in December 2010 by Bayer CropScience, alleged that Dow AgroSciences *Enlist Weed Control System* infringed one of its patents. However, in a ruling issued on 27 September, a federal district court in the US has sided with Dow AgroSciences, determining that the herbicide technology does not infringe Bayer's patent, and that Bayer's overbroad interpretation of its patent claims would render them invalid.

Dow AgroSciences has repeatedly expressed its confidence in its legal position in this case, and the court’s decision has confirmed the company's conviction and resolve to advance technology for its customers. “We are pleased that the ruling fully supports Dow AgroSciences’ position. The court correctly found that Dow AgroSciences did not infringe Bayer’s intellectual property,” said William Wales, vice president and general counsel, Dow AgroSciences. “Dow AgroSciences remains committed to ensuring that this innovative *Enlist* technology is available to farmers struggling with weed control issues.”

MONSANTO TO FUND ACADEMIC RESEARCH ON CORN ROOTWORM

Monsanto has pledged up to $3 million to support academic research on corn rootworm. The Corn Rootworm (CRW) Knowledge Research Programme will provide merit-based awards of up to $250,000 per year for up to three years for outstanding research projects that address specific aspects of corn rootworm biology, genomics and management issues. The US Department of Agriculture has estimated that the damage caused by corn rootworm and the costs associated with controlling it typically total $1 billion annually – including approximately $800 million in yield loss and $200 million in treatment expenses.

The CRW Knowledge Research Programme will be guided by an Advisory Committee that is co-chaired by Dr Steve Pueppke, associate vice president for Research and Graduate Studies and AgBioResearch director at Michigan State University, and Dr Dusty Post, Monsanto’s global insect management lead. Additional committee members include experts from academia and agricultural organisations, and were selected based on their expertise in corn rootworm biology and insect management practices.

Researchers may submit proposals in the areas of corn crop rootworm management; economic impacts of agronomic practices, including control of corn rootworm, corn rootworm biology, physiology, biochemistry and genomics as well as corn rootworm education development. Other types of research may also be considered.

MONSANTO TO PROVIDE ROYALTY-FREE RESEARCH LICENSE

Monsanto is to provide the academic community and other non-profit research institutions with a royalty-free research license to a newly issued US Patent related to the Agrobacterium transformation method. The US Patent and Trademark Office has issued patent claims to Monsanto for this enabling technology following its original filing in 1983. Monsanto remains committed to broadly licensing its seed, trait and enabling technologies to support research and commercial developments that benefit farmers and the customers they serve. Monsanto’s Agrobacterium transformation technology has been previously licensed to other major technology developers for commercial purposes. The

company noted it will continue to make commercial licenses available for this enabling technology as it has proved so beneficial to advancing innovation in global agriculture.

The new announcement, expected to benefit the academic community and other crop researchers, has the potential to further advance research and development of new technologies in key dicot crop plants including soybeans, cotton and canola, as well as speciality crops such as alfalfa, potatoes, tomatoes and sugar beet. “We hope that access to one of the leading agricultural biotechnologies can further both the enablement and development of key agriculture solutions for farmers and consumers alike,” said Robb Fraley, chief technology officer for Monsanto and also one of the leading scientists behind this breakthrough discovery.

The Agrobacterium transformation process was first invented by Monsanto scientists in the early 1980s. Today, plant researchers around the world use several different transformation methods to introduce novel trait technologies into crop plants – some of the primary methods include the Agrobacterium transformation process and the biolistic transformation process. Through these methods and continued advancements in breeding, plant researchers have been able to develop crops with improved nutritional profiles, plants that can better mitigate the effects of drought, as well as other agronomic improvements such as herbicide-tolerance and insect-protection.

“Royalty-free access to research tools like the Agrobacterium transformation process is critical for solving important global agricultural problems, establishing industry-academia collaborations, and training students,” said David Conrad, executive director of NUtech Ventures, a non-profit organisation responsible for building partnerships between the University of Nebraska and the private sector. “We applaud Monsanto for this initiative and encourage other agribusiness companies to adopt a similar approach within the academic and non-profit sectors.”

US BANS IMPORT OF BASMATI RICE

Exports of Indian basmati rice to the US have been suspended due to the presence of excessive levels of pesticide residues found in some batches. Reports in September indicated that the suspension had resulted in a drop in the price of Indian basmati price of over 23%. Chemicals identified have included the fungicides *Bavistan*, isoprothiolane and tricyclazole. The Indian Agricultural and Processed Food Products Export Development Authority (APEDA) commented that they had been in discussion with the FDA not because of any risk to human consumption but because the US maximum residue levels had been exceeded. The problem had been under discussion for about a year. The United States Food & Drug Administration (FDA) first rejected basmati shipments to the US after identifying around eight chemicals in different consignments.

Tricyclazole is a widely used fungicide in many rice growing countries such as India, Thailand, China and Japan. While the EU and Japan allow maximum residue levels (MRL) as high as 1 and 3 ppm, the US pesticide residue norm is 0.01 ppm. It is understood that tricyclazole present in basmati grain was within the level of 0.02-0.04 ppm set by the Indian government and also in line with the WTO (World Trade Organisation) standards. The All India Rice Exporters Association (AIREA) is reported to be asking exporters to pre-test their produce before exporting. Efforts have been made to modify the post-harvesting processing methods, but it is reported that after “extensive research and discussions with scientists” there is no obvious means of reducing residue levels. AIREA has observed that it will be down to farmers to minimise residue levels following Good Agricultural Practice. Application has to be restricted to the pre-flowering stage and no post-harvest application should be applied.

OTHER NEWS AND MARKETS

BASF SCALES UP PRODUCTION

BASF is making an investment of more than €200 million to scale up and further integrate production and formulation capacities in order to meet continued demand for several key fungicides, including *F 500* (pyraclostrobin) and *Xemium* (fluxapyroxad). The investment will drive significant expansions at facilities in Schwarzheide and Ludwigshafen, Germany, as well as Sparks, Georgia, US. These measures will increase production capacity, flexibility and efficiency. It is one of the Crop Protection division's largest capital investments in recent years.

"We continue to expect strong market demand for our portfolio of innovative products in the future. That is why we increased the estimated peak sales potential of our pipeline to €2.8 billion earlier this year," said Markus Heldt, president of BASF's Crop Protection division. "These investments will help to increase our operating efficiency and flexibility, so that we can continue to contribute to sustainable agriculture through our innovative solutions for farmers around the world."

F 500 is BASF's top fungicide and forms the backbone of the successful fungicide portfolio, including the *AgCelence* brand which delivers products that improve plant health and help crops better manage stress and resources. The estimated peak sales potential for *F 500* was raised to more than €1 billion earlier this year. *Xemium* is BASF's next generation fungicide and, since its initial launch in late 2011, has quickly established itself as a winning product with blockbuster potential. It is being sold in combination with *F 500* and azoles for controlling a broad spectrum of critical plant diseases. BASF aims for a peak sales potential of more than €200 million with *Xemium*, based on global launch plans in more than 50 countries and use on more than 100 crops.

BAYER LAUNCHES MORE FOOD CHAIN PARTNERSHIP PROJECTS

Bayer CropScience took the opportunity at the Asia Fruit Logistica 2012 in Hong Kong to present its successful Food Chain Partnership business initiatives. "We are convinced that the best way to ensure high food quality is to connect the dots – bringing farmers, food processors and retailers together in Food Chain Partnership projects," said Dr Birgitt Walz-Tylla, head of Food Chain Management. "We focus on increasing marketable yield, traceability and expanding marketing opportunities."

Bayer CropScience now supports 240 Food Chain Partnerships in more than 30 countries covering most of the main fruit and vegetable crops. The company is offering integrated solutions based on premium vegetable seeds and effective crop protection, enabling farmers to produce high quality fruits and vegetables in a sustainable way. It says advice on good agricultural practices, environmental protection and food safety also contribute to meet consumers' expectations and bring added value.

The company recently launched a new Food Chain Partnership project with the Metro Group and its China based subsidiary Star Farm. The aim of the project located in Jiaxing City, Zheijiang Province, China is the production and marketing of high quality vegetables, such as tomatoes, cucumber and chili peppers. Bayer provides farmers with crop protection products, high quality Nunhems seeds and tailor-made customer services. Star Farm provides professional consulting services to growers which include farm based assessment and training.

In India Bayer CropScience and Mother Dairy Fruits and Vegetables Private Ltd have started working together to improve vegetable production in India. The first project was launched in 2012 with about 900 growers of gherkins and tomatoes in the state of Karnataka. A sustainable crop development programme was implemented and resulted in increased yields, high-quality produce as well as higher income. Bayer CropScience and Mother Dairy plan to expand this successful project to cover more fruit and vegetable crops such as banana, mango and cauliflower.

SYNGENTA EXPECTS SALES ON STRATEGIC CROPS TO REACH $25 BILLION

Syngenta expects the sales for its eight key strategic crops to reach $25 billion by the end of the decade, compared with a previous target of over $22 billion. The increase is being driven by the accelerating rate of innovation and strategy delivery across the company. Syngenta CEO, Mike Mack, commented: "Since we announced our new strategy in February 2011 we have focused on the rapid integration of our commercial teams and on broad-based innovation. I am pleased to say that success in both these areas has enabled us to increase our expectations for future growth across the eight

strategic crops. In May 2012 the company upgraded its sales expectations for corn and cereals. It has now outlined the potential for rice and vegetables, whose combined sales are expected to reach $5 billion.

SYNGENTA BIDS FOR DEVGEN

Syngenta has bid for the Belgian company Devgen, a global leader in hybrid rice and RNA interference (RNAi) technology. The transaction would enable Syngenta to combine its leading crop protection portfolio with Devgen's best-in-class rice hybrids and broad germplasm diversity. Devgen also brings proven expertise in RNAi-based insect control, for which the two companies signed a global license and research agreement to develop spray applications in May 2012. The intended takeover bid is for all outstanding shares and warrants issued by Devgen, representing a total consideration of around €403 million. It has been recommended by the board of directors of Devgen and is supported by a number of major shareholders holding approximately 48% of all shares.

Davor Pisk, Syngenta's COO (APAC and North America), said: "This acquisition will significantly reinforce our leading global position in rice, enabling us further to expand our integrated offers by incorporating the next generation of hybrid rice. We have already demonstrated our ability to integrate technologies in ways which meet the needs of smallholder farmers in emerging markets. Rice is critical to global food security and we expect to make a key contribution to improving productivity." Sandro Aruffo, head of Syngenta R&D, said: "There is immense potential in combining Devgen's pioneering research in both GM and sprayable RNAi-based crop applications with Syngenta's broad crop protection portfolio. By building complementary biological insect control solutions into our offer we can increase the options and capabilities we provide to our customers."

DOW INTRODUCES NEW BRAND IDENTITY

Dow AgroSciences has introduced a new brand and visual identity which forms part of a major brand transformation process that the parent company Dow has undertaken over the past year. "Our close connection to Dow enables us to operate within the framework of a much bigger company that offers scale and strength to our business around the world," says Antonio Galindez, president and CEO of AgroSciences. "The significant investment in innovations by Dow over the past decade has enabled many new agricultural technology collaborations and advances, new product launches, and overall faster business growth."

The new Dow AgroSciences company tagline, *Solutions for the Growing World*, links with Dow's new advertising campaign, *Solutionism*. The adoption of the red DOW Diamond logo with the Dow AgroSciences word mark as its new logo more clearly associates the business as a wholly owned subsidiary of The Dow Chemical Company. The new brand identity also reflects the company's commitment to meet the needs of the growing world through innovative crop protection and plant biotechnology solutions.

Mr Galindez adds that the new brand identity will not change the successful business model being used by AgroSciences. "More than a decade ago, we instituted a successful business strategy that has helped us become one of the fastest growing companies in agriculture, committed to providing innovative crop protection and plant biotechnology solutions," he says. "We see our new brand profile as an important contribution to attaining our long-term strategic goal. Customers around the world will begin to see the new Dow AgroSciences brand identity through crop protection and seed marketing materials and product packaging". The company logo will change at the company's headquarters in Indianapolis this month. Additional Dow AgroSciences sites and offices globally will change to the new visual identity subsequently.

FMC ANNOUNCES LEADERSHIP CHANGES

FMC Corporation has announced some changes in leadership for the company's Agricultural Products Group. Marc Hullebroeck has been named vice president and business director for North America, and Europe, Middle East and Africa. Mr Hullebroeck, who was most recently business director for Eurasia, will also have oversight for global innovation, mergers and acquisitions and strategic marketing. Bob Trogele has been named vice president and business director for Asia. He will also have oversight for FMC Professional Solutions - FMC Agricultural Products' worldwide business unit serving the professional pest control, golf course, lawn and tree care, and nursery and ornamentals markets.

FMC also announced recently the appointment of Mark Douglas as president of FMC Agricultural Products Group, succeeding Milton Steele, who is retiring from the company in early 2013. “These changes are designed to leverage our experience and knowledge across our entire organisation, helping us grow and strengthen the connection between what growers want and what FMC can deliver through our open innovation model,” said Mr Douglas.

FMC COLLABORATES WITH ISAGRO ON DEVELOPMENT OF NEW FUNGICIDE

FMC Corporation has entered into a research and development collaboration agreement for a new proprietary fungicide from Isagro. The two companies will co-develop the new broad spectrum fungicide for use globally. “We are excited by the prospects for this new carboximide fungicide and the expansion of our fungicide portfolio,” said Mark Douglas, president, FMC Agricultural Products. “We are pleased to be continuing our partnership with Isagro, a highly respected company committed to the discovery of highly effective, proprietary agricultural chemicals.”

MONSANTO AND COMPLIX TO DEVELOP ALPHABODY TECHNOLOGY

Monsanto and Complix NV (www.complix.be) have entered into a collaboration agreement to evaluate and develop Complix's proprietary *Alphabody* protein technology in the field of agriculture. Alphabodies are a unique class of protein therapeutics that is potentially active against a broad range of disease targets, including intracellular targets. They are small single chain alpha-helical proteins that are designed by computer modelling, but are inspired by naturally existing protein structures. This collaboration represents the first application of Complix's *Alphabody* technology in agriculture.

"Complix's expertise in protein targeting technology offers a novel platform to further enhance our trait development capabilities," said Bob Reiter, Monsanto's vice president of Biotechnology. “We believe this technology offers great promise and could contribute to development of new traits to protect plants from pests and diseases. We are pleased to be working with Complix to develop this promising technology in a way that might deliver on-farm benefits to our grower customers.” Under the terms of the agreement, Complix will grant Monsanto worldwide exclusive rights to access the *Alphabody* technology for use in plant agriculture. Complix retains the exclusive rights on any discoveries made under this collaboration for use outside the field of plant agriculture.

"Complix is headquartered in Hasselt (Belgium) in the Life Sciences incubator BioVille, and has research facilities in Ghent (Belgium) and in Luxembourg. The company’s own current R&D focus is on the development of novel Alphabody-based therapies for inflammation/autoimmunity and cancer.

MONSANTO REPORTS NET SALES UP BY 14%

Monsanto has reported net sales of $2.1 billion for the fourth quarter of fiscal year 2012. Net sales for the full fiscal year (ending 31 July) were $13.5 billion, a 14% increase over fiscal year 2011. Full year net sales results were driven primarily by higher global corn seeds and traits revenue, and increased soybean seeds and traits revenue in the US and Brazil.

The Seeds and Genomics segment consisting of the company's global seeds and related traits business achieved net sales of $1.2 billion for the quarter, a decrease from the prior year. For the fiscal year, net sales for the segment reached $9.8 billion, a 14% increase over the prior year.

Net sales for the Agricultural Productivity segment (crop protection products and lawn-and-garden herbicide products) for the quarter reached $895 million with gross profit of $250 million. For the fiscal year, the segment delivered net sales of $3.7 billion with gross profit of $986 million, with year-over-year increases that reflect strong performance from the company's *Roundup*, lawn-and-garden and selective herbicides businesses.

In the US branded seed volume in fiscal year 2012 grew by the largest increment in three years and outpaced market expansion. In corn, the company reached 27 million planted US acres (11 million ha) for its *Genuity Reduced Refuge Family.* In 2013, the company is targeting 36 million to 38 million acres. The *DroughtGard Hybrids* system will also be introduced in 2013 in the Western Great Plains under stewardship requirements pending import approvals in key export markets.

In soybeans, the company reached a total of 32 million acres for its *Genuity Roundup Ready 2 Yield* product in the US. The company expects growth to continue and is targeting 39 million to 41 million acres in 2013.

Vegetable sales, up in the fourth quarter compared to the prior year period, were down. In 2013, the company expects the vegetable business to return to growth and continues to anticipate that it will become the company's third largest crop platform in terms of gross profit in the coming years. Cotton revenue decreased year on year due in part to shifts to other crops.
The Seeds and Genomics segment is expected to deliver gross profit in the range of $6.55 billion in 2013, with gross profit growth projected to be divided roughly evenly between the US and international regions. The company again expects Latin America to be a strong source of growth complementing the US business, driven by the continued corn opportunity in Brazil and Argentina. Gross profit for the Agricultural Productivity segment next year is expected to be in the range of $1 billion. The company's research and development spend is projected to be around $1.53 billion for fiscal year 2013.

NUFARM REPORTS SOLID PERFORMANCE IN 2012

Nufarm has reported that its business performed solidly in the 2012 financial year, against a backdrop of mixed seasonal and market conditions in the various geographies in which it operates. Its crop protection business, which accounts for 94% of group revenues, grew by 3% to $2.06 billion and generated an average gross margin of 27% (2011: 27%). The company's seed technologies business grew sales by 39% to $121.0 million and generated an average gross margin of 53%, slightly up on the previous year (52%). Corporate/head office costs were higher in 2012 at $41.4 million (2011: $30.5 million). This, the company says, reflected investment in additional management resources and systems as well as increased incentive payments made in parallel with the earnings recovery in the business.

Reflecting on the past year, Nufarm says that Australia experienced average seasonal conditions. Market conditions in Brazil were mostly positive although areas of the country were impacted by drought. The US had a good start to the season but was then impacted by severe drought. Most European markets had challenging climatic conditions during key periods of the year, while economic and credit risks also increased.

Nufarm's herbicide sales were up 5% on the previous year to $1.43 billion and generated an average gross margin of 26% (2011: 26%). Glyphosate sales represented 22% of crop protection revenues, slightly higher than in the previous year (21%). Pricing and margins improved in some markets, including South America, but increased competitive pressure in Australia and Indonesia led to a fall in glyphosate profitability. Phenoxy herbicides were in strong demand in most markets and Nufarm's leadership position in this segment helped facilitate both higher sales and an increase in margins. Several new formulations and mixtures were successfully launched and a new production facility for a proprietary dry formulation of 2,4-D, was commissioned in India.

Fungicide sales in 2012 were $213 million versus $244 million in the previous year. A lower average gross margin (28% versus 32%) was achieved. The 2012 financial year was characterised by lower fungal disease pressure in most of Nufarm's major geographic markets. Initial registration approvals were secured by Nufarm in France and the UK for azoxystrobin, a major fungicide with global sales in excess of $1 billion. Additional registrations, and related product launches, will follow in other markets. Insecticide sales were down on the previous year ($184 million v $197 million). These sales generated an average gross margin of 35% (2011: 36%). Sales of plant growth regulators (PGRs) were up by just over 12% year on year to $76 million, with a number of niche products positioned in the horticulture segment performing strongly and generating good margins.

Nufarm's spray machinery business, Croplands (Australia and New Zealand), also recorded higher sales ($57 million versus $47 million) and a stronger EBIT contribution.

The company's seed technologies business grew sales by 39% to $121.0 million and generated an average gross margin of 53%, slightly up on the previous year (52%). Underlying EBIT was $30.6 million, up from $26.3 million in the previous corresponding period. This segment includes the global Nuseed business and Nufarm's seed treatment applications. The Nuseed sunflower business experienced strong organic and acquisition growth in 2012. With the purchase during the year of Seeds 2000 USA, Seeds 2000 Argentina, and the breeding assets of Super Seeds in Serbia, Nuseed has established a global breeding and development sunflower platform. Seeds 2000 experienced strong growth in its oilseed sunflower segments in the US and in European markets. The China confection sunflower 9/11 market saw a drop in total plant acreage in 2012 due to carry over grain

stocks from the record crops in 2011. Despite this, Nuseed continued to gain total share of this high value segment.

Nufarm reports that sales of seed treatment chemistry grew strongly in 2012, with the US, Brazil and European markets contributing the majority of that growth. Nufarm supplied seed treatment solutions to a number of major seed companies and says it is increasingly seen as a reliable supply partner in this expanding market segment. During 2012, Nuseed's global headquarters were relocated to Chicago, reflecting its expanding operations in North America. The company also invested in strengthening management, in the optimisation of its seed technologies R&D pipeline, and in the establishment of the Nuseed brand.

With considerable supply pressure on a number of key soft commodities, Nufarm says the pricing outlook in relation to those crops is very strong. If seasonal conditions are supportive, growers will look to take advantage of high crop prices by maximising their yields and this is generally a positive driver of crop protection and seed technology sales. In 2013 Nufarm will continue to remain focused on its strategic growth plans and will implement initiatives and make appropriate changes to support those plans. This will include an investment of capital in areas that are seen to deliver higher and more sustainable returns over the medium to long term. The company says that while there remains considerable uncertainty in relation to market conditions in Europe, it is expecting some improvement in its regional performance as structural changes and a more focused management approach begin to yield benefits.

CONFERENCES AND FEATURES

PRECISION FARMING

*The recently launched National Centre for Precision Farming at the Harper Adams University College, based in Newport, Shropshire, UK (***www.harper-adams.ac.uk/initiatives/national-centre-precision-farming***) hosted a conference on 3 October organised by the Association of Applied Biologists (AAB) titled* Precision Farming for Crop Protection – Practical Use of Variable Rate Application*. Recent research and development projects were presented to delegates with an emphasis on precision weed control.*

The opening paper of the conference was presented by Professor Simon Blackmore, head of the new centre, and focused on the future direction of research in precision farming technologies and in particular the use of small robotic machines. The first application for such smart machines is thought likely to be in the crop scouting domain.

Jan van de Zande of Wageningen University and Research Centre, the Netherlands, gave a paper on the findings of a project to develop variable rate spray application systems in strawberry, leek and pear crops. Prototype sprayers based on canopy density spraying (CDS) have been developed and tested in commercial farm situations. The researchers found there was a knowledge gap in deciding how sensor information on crop growth stage should be used in varying spray volume rates. On average CDS spray techniques resulted in a 30% reduction in spray volume used.

Blackgrass has been a very evident problem this year in the UK because of the weather pattern over the season and the ever increasing buildup of resistant strains. Dr Alistair Murdoch, University of Reading, presented the results of research on automated weed mapping co-funded by the UK technology strategy board with support from industry. Dr Murdoch explained that the spatial variability of weed patches is often consistent between seasons. The potential benefits to farmers of mapping weed patches and adapting consequent spraying/management strategies was estimated at a 2.2 benefit/cost ratio and assuming 5-6% of the arable area was mapped in this way, this could result in a saving of 40 tonnes of herbicide used per year, nationally.

Ben Magri of Syngenta Crop Protection, one of the industry partners on the automated weed mapping project, followed with a presentation describing how to tailor variable rate inputs for better blackgrass control. He explained how important it was to reduce the blackgrass seed load going forward to the next season. With a population of 500 blackgrass plants per m2 95% control left 25 plants per m2 and 99% control left only five plants per m2. With 25 plants per m2 left the problem is likely to escalate in future years. Higher drilling rates can reduce blackgrass tiller numbers by competition from the crop, so variable rate drilling can be used to introduce high seed rates where known patches occur. Herbicide application reduces plant numbers, so high doses on patch areas, by variable rate spraying, can improve control on patches by 5-10%. Together these control techniques can provide a significant improvement in control compared to a ‘standard’ treatment regime.

John Clayton of Micron Sprayers gave a history lesson on band spraying, swiftly moving on to the latest developments from Micron - the Varidome S1 and S3 – which utilise the potential benefits of precision band spraying by introducing GPS or vision guidance and adjustable spray shields. It is now possible to spray in bands between crop rows to within 2-3 cm accuracy by using GPS guidance with real time kinematic (RTK) correction from a ground based mast. Such capability is offered by RTK Farming Ltd in south Cambridgeshire. Shielded nozzles can reduce spray drift to negligible levels and with twin tanks, selective and non-selective herbicides can be used along and between rows.

Nick Tillett of Tillett and Hague Technology Ltd gave an update on the development of automated weed control strategies emerging from two HGCA LINK (HGCA is the cereals and oilseeds division of the UK’s Agriculture and Horticulture Development Board) funded projects. Spot application techniques target the spray to within 2 cm at speeds of up to 5 km per hour. Good results were achieved applying glyphosate to volunteer potatoes in an onion crop. Some 95% control of target weeds was recorded with low crop damage. The field work system used a 6m wide front mounted toolbar with three forward facing cameras linked to a computer system for real time detection and spraying of typically 50% of the target area.

The last paper of the day considered improvements to soil management by use of controlled traffic farming and low pressure traffic systems. Professor Godwin, Harper Adams University College, presented the background to a new multi-discipline long-term project established at Harper Adams University College in October 2011. With machines weighing up to 30 tonnes covering 80-90% of the field area over a season, negative effects on the soil can reduce yield potential by 10-15%. By controlling heavy traffic this can be confined to laneways covering only 20-30% of the field. The aim of the long term project is to develop an integrated mechanisation system to optimise soil and water resources, crop growth, yields and system performance.

BAYER CROPSCIENCE – INVESTING IN THE FUTURE

*Bayer CropScience held its annual press conference in Monheim on 20 September. CEO Sandra Peterson, speaking at her last annual press conference (*see Lead Article*), told delegates that Bayer CropScience is on track for above market growth. Backing this ambition, she said, are plans to invest a total of €7 billion between 2011 and 2016 in R&D and an expansion of production capacities and seed processing facilities.*

Ms Peterson said that Bayer CropScience is well-positioned to propel farming's future by leveraging the opportunities that lie ahead: "We aim to lead the way in sustainable crop solutions, and are heavily investing in R&D, as well as production capacities, to respond to global demand for differentiated crop solutions." She also emphasised the strong progress the company had made since launching its four pillar strategy. The strategy is based on rejuvenating its core crop protection business, reinventing customer-centricity along the entire value chain, refocusing innovation, and extending the company's seeds business. "Our four pillar strategy has transformed the company and set our path for future success," added Ms Peterson. "We have streamlined our portfolio and rebalanced the mix while accelerating the potential of new technologies. These all play a significant role in how we strive to propel farming's future."

"With our strong expertise in seeds, chemistry and biological solutions Bayer CropScience is uniquely positioned in the agricultural industry," said Dr C David Nicholson, Bayer CropScience's head of Research & Development in his presentation. "Our goal is to develop integrated crop solutions that provide farmers with a full package of products and services for the entire growing cycle – from planting the seeds to helping their harvest arrive fresh and in perfect shape on the retail shelves."

To achieve this, Bayer CropScience has integrated its R&D operations across all its three divisions and disciplines. This enables the company to better leverage its full research and development capabilities - spanning weed, pest and disease management to stress-tolerance and yield enhancement - to focus on key crops.

Ms Peterson outlined the extensive range of new products that the company will bring to market over the period 2011-2016, showcasing solutions for its strategic crops. "The seed and crop protection solutions we develop are geared towards helping growers address some of the most critical issues they face. We believe the products that are in our pipeline of new seed, small molecules and biological crop solutions hold significant promise in the market, and expect the peak sales potential for our products being launched from 2011 to 2016 to be at least $4 billion."

Bayer CropScience is also determined to secure its future growth by investing in production capacities and seed processing facilities. At the same time, through these investments the company aims to extend its cost and safety leadership in the industry. Over the period 2011-2016, the company has earmarked €2 billion to build up further facilities for the production of crop protection products as well as seed breeding, production and processing facilities. These plans will see the company invest in advanced process technology and substantially increase its global asset footprint, while at the same time enhancing its global supply flexibility. "Given the strong global demand we expect to see for our products, we are significantly expanding the capacities of our top crop protection active ingredients, including our best-selling brands like the *Fox* (trifloxystrobin + prothioconazole) fungicide family and *Liberty/Basta* (glufosinate) herbicides," said Achim Noack, Bayer CropScience's global head for product supply.

The company is already expanding its global breeding network for various crops as part of plans to build up its global footprint in Seeds. "Our goal is to apply our world class production and supply chain expertise to our rapidly growing global seed production and processing infrastructure," Mr Noack emphasised.

Ms Peterson also emphasised that the company's Seeds business – formerly referred to as BioScience – is set to continue its rapid pace of growth. "We expect Seeds to double to around 20% its contribution to the company's overall sales by 2016," she revealed. The unit recorded a 21% increase in sales in the first half of this year on the back of significant growth in broad acre crops.

UPCOMING CONFERENCES

Biopesticides

Informa Life Sciences is holding its annual Biopesticide conference (**www.informa-ls.com/event/biopesticides12**) at the Radisson Blu Hotel, Berlin, Germany on 5-6 December 2012. It promises an extensive agenda that addresses the most critical regulatory developments and examines key strategies that will optimise biopesticide production. There are sessions on the regulation of biopesticides, R&D case studies and updates, biopesticide manufacturing and technology platforms for biopesticide production. There will also be a number of presentations from the European Commission and five regulatory authorities. The organisers say the event will bring together market pioneers who are experts within the biopesticide sector.

The Association of Applied Biologists (AAB) Advances in Biocontrol conference (**www.aab.org.uk**) is being held on 16-17 October 2012 at the Olde Barn Hotel, Marston, Lincolnshire. The organisers say that they are continuing with a broadly similar approach to 2011. It is still their intention to create a gathering of the biocontrol community at which young scientists, experienced researchers and practitioners can meet and share their knowledge and skills. However, at the suggestion of 2011 delegates, they have made changes to enable more time for informal interaction between participants. They hope that this will lead to more exchanges between people with complementary expertise which will in turn help to promote collaborative ventures.

Off Patent Products and Generics

The 7th annual *Crop Protection: Off Patent Products and Generics* event *(***www.informa-ls.com/event/crop2012***)* held at the Crowne Plaza Amsterdam City Centre Hotel on 20-21 November 2012 is organised by Infoma Life Sciences. It says the meeting will explore revenue generating opportunities for R&D and post patent and generic companies. Topics to be presented include The Future Outlook for Off Patent and Generic Products, Maximising Commercial Opportunities, Regulatory Procedures and Business Prospects in Latin America and CIS Markets, Anti-Counterfeiting Strategies, Implementation of 1107/2009, Data Protection, Zonal Authorisations Procedures, Impact of AIR 3 and Parallel Trade.

CropWorld Global

CropWorld Global 2012 Conference and Exhibition (**www.cropworld-global.com**) will be held on 6-7 November 2012 in central London at the QE11 conference centre. This is an international, cutting edge congress focused on the business, trade, science and technology for sustainable crop production. The organisers say that the event brings together the biggest players from across the crop production industry including seed suppliers, agrochemical manufacturers, distributors, farmers and growers, research organisations, governments, industry associations, food producers and food retailers. This event is described as a must attend meeting for global professionals to delve into the key issues impacting the crop production industry and gives delegates the opportunity to find out how to profit from the drive for sustainable intensification.

With 70 plus exhibitors, the organisers say the *CropWorld Global* exhibition will provide a unique cross-industry networking opportunity and welcomes more than 2000 visitors from the global industry to review, display and discuss new products and business opportunities. 2011 saw the introduction of an R&D platform situated on the exhibition floor presenting delegates and visitors with the opportunity to hear about the latest research, products and technologies from entrants in the poster sessions, sponsors and exhibitors.

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