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international news, comments, features and conference reports

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LEAD ARTICLES

BASF HALTS GM DEVELOPMENT IN EUROPE

BASF intends to concentrate its plant biotechnology activities on the main markets in North and South America and the growth markets in Asia because of widespread opposition to the technology in Europe. The company will adjust its portfolio and the site footprint of its subsidiary BASF Plant Science to reflect this change. The headquarters of BASF Plant Science will be moved from Limburgerhof, Germany, to Raleigh, North Carolina. Research and development activities will be concentrated mainly in Raleigh, Ghent, Belgium and Berlin, Germany. Development and commercialisation of all products targeted solely at cultivation in the European market will be halted. These include the genetically modified starch potatoes Amflora, Amadea and Modena, a potato resistant to the disease late blight called Fortuna as well as a late blight resistant starch potato and a wheat variety resistant to disease. To maintain all options for the potato products, BASF Plant Science will continue the regulatory approval processes for the products already started. The company says it will also continue its quest to secure regulatory approval to grow a blight-resistant potato in Europe.

In a statement, Dr Stefan Marcinowski, a member of the BASF board of executive directors, said: “We are convinced that plant biotechnology is a key technology for the 21st century. However, there is still a lack of acceptance for this technology in many parts of Europe – from the majority of consumers, farmers and politicians. Therefore, it does not make business sense to continue investing in products exclusively for cultivation in this market. We will instead concentrate on the attractive markets for plant biotechnology.”

BASF says 157 employees work for Plant Science at the current headquarters site in Limburgerhof. The company will retain only 11 of these positions in functions such as regulatory for Europe. The activities of BASF's Crop Protection division in Limburgerhof will not be affected.

BASF plans to close its other biotechnology sites in Gatersleben, Germany, and in Svalöv, Sweden. Currently there are 57 people working in Gatersleben and six in Sweden. The company plans to transfer 123 positions from Limburgerhof and Gatersleben to other BASF Plant Science sites, mainly Raleigh, and will remove 78 positions over the next two years. Overall, this means that BASF is losing 140 positions in Europe, although it does aims to offer the affected employees other positions within the business.

The company’s research facilities at Metanomics in Berlin and CropDesign in Ghent will be strengthened. “Although the conditions for cultivation of genetically modified crops in Europe are unfavourable, there are world-class research institutes and universities in both Berlin and Ghent,” explained Dr Peter Eckes, president of BASF Plant Science. “We have excellent scientists and facilities there and at our research sites in North America. We will continue our industry-leading research at these locations in order to further build an attractive gene discovery platform and strengthen our position as the trait technology partner.”

BASF Plant Science’s product pipeline will continue its strong focus on the yield and stress projects in which crops are developed with higher yields and improved resistance to stress conditions like drought. This includes the collaboration with Monsanto for corn, soy, cotton, canola and wheat. At the end of 2011, the first product from this partnership, drought-tolerant corn, was approved for cultivation in the US. *Cultivance* soybeans, developed together with Embrapa, were approved for cultivation in Brazil at the end of 2009, and the approval process for key export markets is ongoing.

Denis Murphy, a professor of biotechnology at the University of Glamorgan, UK, was reported in *Nature* to have said: “Europe is now in danger of becoming a scientific backwater and will be unable to assist developing countries to address food insecurity. There is now a real danger that we will lose, not only companies like BASF, but also academic researchers and students as well as any influence that we have had previously in developing countries where we used to be major providers of assistance and expertise.”

PIPELINE VALUE INCREASES TO €2.8 BILLION

BASF has also announced that the value of its crop protection pipeline increased by €400 million to €2.8 billion. Growth was mainly driven by the company's leading fungicide F 500, which is now expected to exceed peak sales of €1 billion. First sales of the company's new blockbuster fungicide *Xemium* were registered at the end of 2011 after receiving registration in key European cereal markets and is on track to achieve estimated peak sales of more than €200 million. In addition, several projects from early research have been promoted to development status, including first solutions from the newly established unit for crop resource and stress management, Functional Crop Care. All of these innovations are scheduled for launch by 2020.

"In four years we have increased the value from €1.8 billion to €2.8 billion," said Markus Heldt, president of BASF's Crop Protection division. "Moreover, in 2011, the company realised a major part of the €1.6 billion peak sales potential from active ingredients launched since 2002. This shows our strong ability to successfully commercialise our products." In 2011, the company invested 9-10% of its crop protection sales in research and development. Total peak sales potential for innovations launched within the current decade account for €1.2 billion.

EUROPEAN NEWS AND MARKETS

EXOSECT'S EXOSEX SPTAB RECEIVES SPANISH APPROVAL

Exosect (**www.exosect.com**) has received Spanish regulatory approval for its unique pheromone mating disruption product, *Exosex SPTab*, for use in postharvest storage and food manufacturing facilities. *Exosex SPTab*, a unique mating disruption product controls the five key stored product moths which infest stored commodities including cereals, cocoa, pulses and tobacco as well as flour mills, confectionary, herbs, spices, dried fruit and nut production facilities. It is one of the few products available to use in place of fumigation and can also be used in Integrated Pest Management (IPM) programmes to reduce pesticide use. *Exosex SPTab* was first developed in the UK where it was awarded the UK's Society of Food Hygiene Technology (SOFHT) Award for 'Best new product' in 2008.

The product has since been rolled out throughout Europe where it is available in UK, France, the Netherlands, Germany, Italy and now Spain. The product was also launched in Japan in 2011 and is fully registered in the US. *Exosex SPTab* will be launched at Expocida in Madrid on the 23 and 24 February and is to be exclusively distributed in Spain by Comercial Química Massó who markets speciality chemicals for a range of industries including agriculture and pest control. Martin Brown, managing director of Exosect commented: "This product has proven to be of significant benefit to those trying to reduce pesticide use where there are limited alternatives, especially since the removal of methyl bromide". He continued: "The fact that the product can be placed throughout a structure where people can continue to work as normal is a major cost-benefit in itself but in addition to this, the low level of pheromone in the product means that it does not shut down pest monitoring systems which are used for audit purposes."

MAKHTESHIM TO MARKET EXOSEX IN FRANCE

Exosect has also announced that its *Exosex CM* mating disruption technology has now received registration for commercial use in France. Used as part of an IPM strategy to reduce the population of codling moth on apples and pears, the product will be launched this year by Makhteshim Agan France. Carine Reyniers, product manager for fungicides and insecticides at Makhteshim Agan, commented: "We are very excited about including *Exosex CM* within our product portfolio and as a tool for IPM and will support our growers in managing pesticide residues." *Exosex CM* is now commercially available in the UK, Belgium, Italy, Greece, the Netherlands, Austria, Portugal, and France.

STUDY MEASURES IMPACT OF FUNGICIDES ON ITALIAN RICE

A recent study carried out by the CropLife Foundation (**www.croplifefoundation.org**) measured the value of fungicides to the Italian rice market. The study found that on average, Italian farmers produce 1.5 million tons of rice with a value of $541.4 million on 238,000 hectares. Some 75% of the area is treated with fungicides to prevent rice blast, the main cause of lower yields for Italian farmers. The fungus is capable of infecting rice plants at all stages of growth. The disease is also known as leaf blast, node blast, panicle blast, collar blast, and rotten neck blast, depending on the part of the plant affected. According to the study rice production would decline by almost 30% if not treated with fungicides. The total annual loss for Italian farmers would be $162.7 million dollars. CropLife Foundation is a charitable research organisation. It was created in 2001 to promote and advance sustainable agriculture and the environmentally sound use of crop protection products and bioengineered agriculture.

FRENCH GOVERNMENT UPHOLD BAN ON GM MAIZE

The French government has announced that it will uphold its ban on MON810, an insect resistant strain of Monsanto's genetically modified maize, even though France's highest court overturned the moratorium last year. The ecology and agriculture ministers said in a statement they would maintain the ban on MON810 which is sold in several European countries, after meeting with farming groups.

The court had found that the government had not produced enough evidence to prove that MON810 posed a significant risk to health or the environment. The decision followed a ruling by the European Court of Justice in early September saying that France had based its ban on the wrong EU legislation. President Nicolas Sarkozy responded by saying that the government would study ways of extending the ban, invoking the need to defend farmers' health.

During recent action at one of Monsanto's plants in France, anti-GM activists claimed that Monsanto was about to start selling MON810 seed to farmers ahead of the 2012 season. Monsanto has, however, denied this and has responded by saying that it "considers that favourable conditions for the sale of the GM seed in France in 2012 and beyond are not in place."

EUROPOL ISSUES WARNING ON COUNTERFEIT PESTICIDES

The European crime intelligence agency Europol has issued a warning that organised crime groups in Europe are behind a growth in the trade of illegal and counterfeit pesticides. The agency said organised criminals have been attracted to the exceptionally 'low risk – high profit' margin of the market. This, combined with the lack of harmonisation in legislation and implementation, means that the trade is growing rapidly, according to Europol intelligence. North East Europe in particular has been targeted by the criminal networks involved in the supply of illegal and counterfeit products, but the agency warned that the pesticides have been found throughout Europe. In some countries, more than 25% of the pesticides in circulation are believed to come from the illegal market. In fact it is estimated that the global trade in illegal pesticides earns criminals billions of euros each year.

Europol said the pesticides threaten not only the health of farmers and consumers, but pose a serious risk to the natural environment. The illegal products can also be used as precursors for home-made explosives due to their lack of traceability. The agency has called for an EU study to be conducted into the traceability of pesticides and their chemical components. In addition it called for the launch of cross-border investigations, using the cooperation of law enforcement agencies in different member states, especially during the 'importing season' (January/February) and a review of pesticide laws.

The warnings over threats to the environment and public health posed by illegal pesticides are not unfounded; in May 2011, two multi-tonne shipments, intercepted in Eastern Europe, contained substances banned in the EU for their endocrine disruptive properties. A Pesticide Action Network spokesperson said that, although often farmers did not know they were dealing with organised crime syndicates, in some cases, farmers knowingly bought counterfeit products because they were cheaper.

DUPONT CONTRIBUTES TO MAIZE RESEARCH

DuPont has joined the DROught-Tolerant Plants (DROPS) Research Consortium and will contribute expertise and a state-of-the-art modelling platform for maize research for use by the consortium. DROPS, a European Commission-sponsored consortium, is developing novel tools and breeding strategies that advance drought-tolerance research in maize and other crop plants. As a member, seed subsidiary Pioneer Hi-Bred will share its expertise in drought research to help bring solutions for drought tolerance faster through science. "Drought is a universal challenge that must be addressed to feed a hungry planet. It will take many of us working together in collaborations to bring farmers solutions for combating drought globally," said John Soper, vice president, Pioneer Crop Genetics Research and Development. "Innovations developed through this collaboration will complement our own research programme."

The Pioneer maize crop modelling platform, developed through a long-term collaboration between Pioneer and researchers at the University of Queensland, facilitates the efficient advancement and development of drought-tolerant hybrids, ultimately helping growers meet the increasing demands on agricultural productivity. This unique platform allows researchers to input a number of specific characteristics about how experimental plants behave under test conditions, and facilitates prediction of those few that will respond best under drought conditions in the field.

The DROPS Consortium was initiated by the Institut National de la Recherché Agronomique (INRA) of France. It brings together 15 leading researchers and their respective organisations to develop solutions for drought in important crops including maize. Representatives from the group met recently to set out work plans. Pioneer is the only US-based member of the European-led consortium. Project leader Francois Tardieu noted: "The DROPS consortium brings together an unprecedented mix of leading global expertise to tackle the grand challenge of improving crop adaptation to drought."

THERMOSEED FACILTY OPENS IN NORWAY

Felleskjöpet Agri SA **(www.felleskjopet.no)** has opened a new seed processing plant in Holstad, Norway that will treat around 25,000 tons of seed per year. This makes Norway the second country in the world to start using the ThermoSeed method on this scale. The method is an effective and environmentally friendly method for disinfecting seed with hot humid air without the use of chemicals.

ThermoSeed was developed by the Uppsala company SeedGard AB and it has since been acquired by Incotec, the company responsible for the development of the ThermoSeed technology and its launch internationally. Following a long period of evaluation and analysis Felleskjöpet Agri SA decided to replace a large proportion of its plant protection products with ThermoSeed. Bjørn Stabbetorp, marketing manager at Felleskjøpet Agri SA says: "It feels like the right moment to invest in a sustainable alternative for now and the future and to phase out the use of chemicals".

AMERICAN NEWS AND MARKETS

BAYER RECEIVES APPROVAL FOR TWINLINK COTTON

Bayer CropScience has received registration from the US Environmental Protection Agency (EPA) for its *TwinLink* technology for cotton in the US. *TwinLink* combines insect-resistance for effective management of a number of lepidopteran pests (caterpillars) and tolerance to glufosinate-ammonium herbicides (*Liberty*). When commercialised, the technology will be offered to US cotton growers as a stack with *GlyTol*, the company's proprietary glyphosate tolerance technology. This stacked product will be the industry's first dual-gene herbicide tolerance, dual-gene insect resistance solution for cotton.

"*TwinLink* technology will be an important solution for cotton farmers looking to improve their crop management choices and increase their productivity in a sustainable way. It is also a critical tool for effective weed and insect resistance management - a serious challenge facing growers in the US and increasingly in other important production areas around the world," said Mathias Kremer, head of the BioScience business unit of Bayer CropScience. It is anticipated that the first cotton varieties with the *TwinLink* and *GlyTol* stacked traits will be available in the US from 2013 onwards, pending additional regulatory approvals in key import countries. To date, *TwinLink* has been approved in Australia/New Zealand, Brazil, Canada and the US. Additional regulatory approvals are pending globally. Bayer says *TwinLink* is the next product in a series of new weed and insect management solutions being developed for the cotton farmer. In 2011, the company launched three new cotton products containing *GlyTol* in their high-performance *FiberMax* cotton seed varieties in the US including the cotton industry's first combined dual herbicide tolerant varieties featuring both *GlyTol* and *LibertyLink* technologies.

CERTIS INTRODUCES BIOINSECTICIDE FOR CODLING MOTH CONTROL

Certis USA has introduced a high potency codling moth virus that will be commercially available to apple and pear growers in select states this season. *CYD-X HP* bioinsecticide contains potent occlusion bodies (OBs) selected from a naturally occurring virus, C*ydia pomonella* granulovirus or CpGV, that infects and kills larvae of the codling moth. Larvae only need to ingest one or two OBs to cause a lethal infection. CYD-X HP can be used at ultra low rates, as low as 0.5 ounces per acre, making it a highly cost-effective control product. The product provides growers with an economical alternative for managing resistance and residues. Because it is tank-mix compatible with most other insecticides, fungicides and fertilisers, no additional orchard applications are required. *CYD-X HP* will be packaged in an easy-to-use 6-ounce bottle.

Certis says that *CYD-X HP* is highly specific to codling moth, so it is not harmful to beneficial insects, fish, wildlife, livestock or humans and can be successfully used with mating disruption programmes. It is approved by the National Organics Programme (NOP) for use in organic production and is Organic Materials Review Institute (OMRI) listed. It has a four hour re-entry period and zero-day pre-harvest interval. Tim Damico, Certis USA executive vice president NAFTA, said: "*CYD-X HP* is the most potent codling moth virus product ever introduced. It reflects Certis' commitment to bring new technologies to the market that translate into high value for growers. Products such as this meet the demands of today's fruit growers who are seeking sustainable alternatives, harvest management solutions, and low residues for market flexibility and export accessibility."

BASF PRESENTS NEW DICAMBA FORMULATION

BASF Crop Protection presented the herbicide *Engenia*, the company's next-generation formulation of dicamba at the 65th Annual Meeting of the Southern Weed Science Society (SWSS). *"Engenia* will be an important new tool for soybean growers to use against herbicide-resistant weeds like Palmer amaranth, waterhemp and marestail," said Paul Rea, vice president, US Crop Protection, BASF. "Research has demonstrated that *Engenia* will provide a valuable, new herbicide option as part of a comprehensive weed control system to help growers protect their crops from yield-robbing weeds."

BASF says that the research presented on *Engenia*, as well as the recent launches of the herbicides *OpTill PRO* (saflufenacil + imazethapyr + dimethenamid) and *Armezon (*topramezone*)*, demonstrates the company's commitment to provide growers with new chemistries and products to help maximise their yield potential and proactively manage resistant weeds. *Engenia* will be used with the dicamba-tolerant soybean system currently in development. BASF anticipates making a submission to the regulatory agency in the US in 2012. US Environmental Protection Agency (EPA) approval of *Engenia* is anticipated prior to commercialisation of Monsanto's *Genuity Roundup Ready 2 Yield* dicamba-

tolerant soybean system. Commercialisation of the new system for soybeans is expected around 2015 with cotton, corn and canola to follow.

EPA APPROVES CONTINUED USE OF ALDICARB

The US Environmental Protection Agency (EPA) has approved AgLogic L.L.C's registration of *Meymik 15G.* The registration will ensure continued availability of aldicarb for pest control on registered crops, although there are questions about product availability for the coming season. *Meymik 15G* is approved for use on cotton, peanuts, sugar beets, dry beans, sweet potatoes, and soybeans to control certain nematodes, insects and mites. In public comment requested by the EPA, producers and grower organisations concerned about the loss of crop productivity, strongly supported the responsible and continued use of aldicarb.

The National Cotton Council estimated the value of aldicarb to US cotton growers in 2011 would have exceeded $800 million if just 25% of the planted area of cotton was treated. AgLogic says there is no single alternative product comparable to aldicarb, which can enable growers to control nematodes, mites and insects from a single at-plant or early season application. Over 40 years of research and use have demonstrated that aldicarb provides systemic residual control of more than 75 species of insects and mites, and at least 40 species of plant-parasitic nematodes. The company is committed to the careful stewardship, proper handling and responsible use of *Meymik 15G* through continuing user education, applicator certification and proactive training at all levels.

MAKHTESHIM WINS FIPRONIL PATENT INFRINGEMENT CASE

The Makhteshim Agan Group (MAI) says it has won a fipronil patent infringement case brought against it by BASF and Bayer CropScience in April 2010.The US District Court for the Middle District of North Carolina ruled in favour of MAI North America and its US subsidiary, Control Solutions Inc. (CSI), finding that its fipronil insecticide does not infringe BASF and Bayer's patents. BASF said it will appeal the decision. The company also announced it settled a separate fipronil infringement suit against Denmark's Cheminova, which it filed simultaneously 18 months ago.

In June 2011, MAI's affiliate CSI launched sales of fipronil-based products under the brand names *Taurus* for the professional pest control market and *Prefurred* for companion animal use. MAI's *Taurus* was the first major generic version of fipronil to become available in the US. "In creating *Taurus*, MAI took advantage of novel, advanced technologies to design a new manufacturing process," said Shaun Friedland, head of MAI's Americas region. He added that MAI will continue marketing the products in the US, and plans to launch new fipronil-based products to other markets too. Fipronil is utilised for termite prevention and treatment, flea and tick control, and as a broad-spectrum insecticide for crop markets in a variety of branded products throughout the world. The active ingredient is used in crop protection mainly for treatment of cotton, potatoes, rice and seed treatment in addition to broad uses for non-crop applications.

STOCKTON BIOFUNGICIDE APPROVED IN CHILE

Stockton Group, a global crop protection company (**www.stockton-ag.com**), has received approval for *Timorex Gold* in Chile for use in grapes and sugar beet. *Timorex Gold* is a proprietary multi-component biofungicide based on a plant extract of *Melaleuca alternifolia* registered in over 19 countries, and now in Chile. The fungicide is recommended for the control of powdery mildew (*Erysiphe necator*) in spray programmes in organic and IPM vineyards. The fungus infects leaves, stems and fruit, usually at the beginning of the season. If uncontrolled, it spreads steadily through the vineyard causing serious disease and crop losses on susceptible varieties. It is a common and widespread disease of grapevines in Chile. *Timorex Gold* may be applied throughout the growing season of the crop and will provide satisfactory control of the disease on both cluster and leaves. It leaves no residues, reduces the pesticide load and is an effective tool in resistance management.

TESSENDERLO PURCHASES CARBARYL FROM BAYER

Tessenderlo Kerley, Inc. (TKI), a US subsidiary of Tessenderlo Group, has purchased the crop protection assets of the global carbaryl business from Bayer CropScience. Bayer retains the non-crop business. Carbaryl is marketed under the *Sevin* brand, as well as other associated trademarks in 40 countries. TKI will acquire trade names, know-how, registrations and registration data. Responsibility for the carbaryl product will be undertaken by TKI's business unit, NovaSource (**www.novasource.com**). NovaSource Group vice president David Cassidy said: "The acquisition of the carbaryl insecticide franchise is another step in the planned expansion of the company's niche crop protection product portfolio, following the acquisition of the terbacil and linuron businesses from

DuPont, the *Surround* business from BASF and the *Purshade* business from Purfresh." Jordan Burns, CEO of TKI, added: "TKI is committed to expanding its crop protection portfolio. We intend to continue building our NovaSource Crop Protection group with the addition of strategic products as they become available."

MONSANTO INCLUDES DIREX IN ROUNDUP READY PLUS PROGRAMME

Monsanto's *Roundup Ready PLUS* Programme will include Makhteshim Agan's herbicide *Direx 4L* (diuron). US Delta and Southeast cotton growers who use *Direx 4L* during the coming season will receive a $12 per gallon incentive (up to $3 per acre per application) when following the *Roundup Ready PLUS* guidelines. The herbicide is used to control glyphosate-resistant Palmer amaranth (pigweed) and marestail (horseweed) and is applied preplant, pre-emergence or post direct. The product is used on crops ranging from cotton and citrus to alfalfa, tree nuts and fruits to vegetables and grains. Used alone or in combination with other herbicides for season-long weed control

Makhteshim's residual herbicides *Cotoran 4L* (flometuron) and *Cotton Pro (*prometryn*)*, will also receive the same $12 per gallon grower incentive under the *Roundup Ready PLUS* initiative. *Cotoran* is used as a pre-emergence herbicide for broad spectrum control of grasses and broadleaves, while *Cotton Pro* can be used pre-emergence or post-direct to provide contact and residual control for later germinating weeds. These products also control weeds known to have resistance to glyphosate including Palmer amaranth.

Dave Downing, Makhteshim's herbicide product leader said: "These herbicides are a perfect fit for high-impact weed control systems under the *Roundup Ready PLUS* platform which helps growers to reduce their annual weed control costs." Makhteshim Agan acquired *Direx 4L* and *Karmex DF* herbicides from DuPont Crop Protection last year. As part of the global acquisition, Makhteshim Agan Industries received all rights, registrations, and supporting regulatory data, including trademark rights, making the company the major supplier for all non-mixture diuron formulations in the US.

INSECTICIDES CONTRIBUTE TO BEE DEATHS

Honeybee populations have been in serious decline for years, and scientists in the US may have identified one of the factors that cause bee deaths around agricultural fields. Researchers at Purdue University, West Lafayette, Indiana have recently published work carried out over two years in Indiana. The results indicate that insecticides used as corn and soya bean seed treatments can be a contributing factor to the decline in honey bee populations.

Seeds of most annual crops are coated in neonicotinoid insecticides for protection after planting. All corn seed and about half of all soya bean seed is treated. The coatings are sticky, and in order to keep seeds flowing freely in the vacuum systems used in planters, they are mixed with talc. Excess talc used in the process is released during planting and routine planter cleaning procedures.

Analyses of bees found dead in and around hives from several apiaries showed the presence of neonicotinoid insecticides. The insecticides were found to be present at high concentrations in the waste talc that came away from the seed during planting. The insecticides clothianidin and thiamethoxam were also consistently found at low levels in soil up to two years after treated seed was planted, on nearby dandelion flowers, and in corn pollen gathered by the bees. Christian Krupke, associate professor of entomology at Purdue and a co-author of the findings reported: "We know that these insecticides are highly toxic to bees; we found them in each sample of dead and dying bees." The US is losing about one-third of its honeybee hives each year. Greg Hunt, a Purdue professor of behavioral genetics, honeybee specialist, and also a co-author, indicated that no one factor is to blame.

Mr Krupke suggested that efforts could be made to limit or eliminate talc emissions during planting. "That's the first target for corrective action," he said. "It stands out as being an enormous source of potential environmental contamination, not just for honeybees, but for any insects living in or near these fields. The fact that these compounds can persist for months or years means that plants growing in these soils can take up these compounds in leaf tissue or pollen." The US Department of Agriculture estimates the value of honeybees to commercial agriculture at $15 billion to $20 billion annually.

CARBENDAZIM IN IMPORTED ORANGE CAUSES PRICE VOLATILITY

At the end of December 2011 the US Food and Drug Administration (FDA), was informed by the Coca Cola company, a major importer of orange juice into the US, that the fungicide carbendazim had been detected in orange juice imported from Brazil. Carbendazim is approved for use in citrus in many

countries. In Brazil the fungicide is registered for use for the control of citrus black spot (*Guignardia citricarpa*). However, in the US carbendazim is not approved for use on oranges. Furthermore the Environmental Protection Agency, EPA, has neither established a tolerance for carbendazim nor an exemption from the need for a tolerance. This makes the presence of carbendazim in orange juice an unlawful pesticide chemical residue under the Federal Food, Drug, and Cosmetic Act. The EPA's position is based on data showing carbendazim to cause birth defects in rodents and some chromosome problems in human cells in laboratories.

On 9 January the FDA informed the US Juice Products Association, by letter, of its position. It stated that the EPA has conducted a preliminary risk assessment from which it was concluded that consumption of orange juice with carbendazim at the low levels that have been reported does not raise safety concerns. The FDA stated that it did not intend to take action to remove orange juice containing the reported low levels of carbendazim. However, it did say it was intending to conduct its own testing programme. In the event that carbendazim was reported at levels that presented a public health risk, the FDA said it will would alert the public and take the necessary action to ensure that the product was removed from the market. The FDA also announced that it would be sampling imported shipments of orange juice and would deny entry to any shipments that showed carbendazim with levels in excess of 10 ppb. It also asked the industry to encourage suppliers to control how the fungicide was used such that residue levels were minimised. This announcement created something of a panic in the juice trade with an 11% price rise reported in one day.

By 10 January the price had risen by 23% from the beginning of the year. Subsequently, however, the price has eased. The US is the largest importer of orange juice in the world. It imports about 26% of its domestic consumption and Brazil supplies about 10%. According to the Juice Products Association most juice sold in the US is a mix of domestic and imported product.

The European Commission (EC) has stated that it too, will start testing for carbendazim in orange juice imported from Brazil if the US authorities detected unacceptable levels. However, detection levels of carbendazim in orange juice up to 200 ppb are accepted by the EC. By 27 January it was reported by the FDA that 11 of 80 orange juice import shipments contained concentrations of 10 ppb or higher. Nine of these shipments were detained while manufacturers of two other shipments voluntarily halted imports. The shipments originated in Mexico, Canada, Costa Rica, Belize, Honduras, Lebanon, Turkey, as well as in Brazil.

OTHER NEWS AND MARKETS

DUPONT SALES CLIMB

DuPont reported tough markets for several of its key businesses for the end of 2011, but said once again, it was agriculture that led the way with increased demand for seeds in Latin America. Sales in the region climbed more than 40% in the second half of 2011. Total agriculture business sales for the fourth quarter totaled $1.3 billion, up 8% with 5% higher selling prices and 3% higher volume. For the full year, higher volumes lifted the segment's sales by 23%. Crop protection sales for the quarter rose 9% to $676 million with growth across all major product lines in most regions. All regions posted double-digit sales gains in the second half of the year led by volume growth and higher prices in the Latin American market. Full-year crop protection sales totaled $2.9 billion, up 16%.

Demand in Latin America and Asia pushed the company's *Rynaxypyr* insecticide sales in 2011 to $580 million, accounting for about 20% of its total crop protection sales. DuPont intends to launch the next product in the line, *Cyazypyr* (cyantraniliprole), in the later part of 2012. It said: "We continue to refresh and renew our crop protection portfolio by divesting older chemistries, while accelerating our R&D pipeline advancements and new product launches."

Looking ahead to the first half of 2012 DuPont expects its agriculture business to rise moderately with mid-single-digit earnings growth. Its assumptions are based on strong operating performance in the businesses and delivering volume growth and pricing gains, offset in part by the transient impacts of input cost increases, continued growth investments and significant currency headwinds. DuPont received regulatory approval last year for *Optimum AcreMax* and *Optimum AcreMax Xtra* corn and expects to get clearance for the next product in the genetically engineered insect-resistant corn line, *AcreMax XTreme*, in the first half of this year. Its international seed business, Pioneer Hi-Bred, reported a 17% gain for the year to $6.3 billion, boosted by volume growth and higher prices. Success was underpinned by new product penetration, increased acreage and share gains in North America, volume growth and prices.

CLARIANT TO OPEN NEW CROP PROTECTION LAB IN INDIA

Clariant has announced the opening of a new crop protection laboratory by its industrial & consumer specialties (ICS) business unit in India. The new laboratory, located at Clariant's Kolshet site in Thane, near Mumbai, was inaugurated by Christian Vang, head, ICS, Asia-Pacific. Development activities at the state-of-the-art facility will focus on building a unique portfolio of crop protection guideline formulations, using the company's ranges of emulsifiers, adjuvants, dispersing agents and new innovative chemistries derived from renewable resources. The emphasis will be on eco-friendly, active ingredient delivery systems for emulsions, suspension concentrates (SC), water dispersible granules (WDG), oil dispersions and encapsulated technologies based on the company's specialty performance additives.

The new laboratory is considered to be the cornerstone of the company's global market approach to provide strong local formulation support to the crop protection industry. Profiling services and support on regulatory guidelines from the global competence centre in Germany will complement the services offered to customers. Dr Alexander Snell, head, BU ICS India said: "The facility is fully equipped with a spray drier, extruder and spherodiser, as well as a bead mill, a jet mill and a fluidised bed processor. It will assist customers in developing new formulations and bringing products faster to market, in response to rapidly ever-evolving needs."

ARYSTA INTRODUCES NEW PRODUCTS FOR IPM IN JAPAN

Arysta LifeScience has introduced two new products, *Swirski Plus* (*Amblyseius swirskii*) and *Spical Plus* (*Neoseiulus californicus*), for integrated pest management in Japan. Both products are from Koppert Biological Systems and can be used in a wide range of fruit, vegetable and ornamental crops. *Swirski Plus* targets the young larvae of various thrips species, as well as the eggs and larvae of whitefly (both *Trialeurodes vaporariorum* and *Bemisia tabaci*). *Spical Plus* controls an array of spider mites. "Both offer a new breeding and application method for predatory mites," said Zenjiro Nakamura, product manager, Arysta LifeScience Japan. "The mites are packed in a slow-release sachet, along with bran and prey, and are released into a crop regularly over several weeks to control pests. This is particularly important in crops where no alternative food crops are available for the pests such as cucumbers, roses, chrysanthemums and potted plants in which pest pressure must be kept at a low level."

In 2009, Arysta LifeScience Japan launched *Swirski* predatory mites in a bottle (with bran). Although effective against pests, the bottled formulation was difficult to apply to some crops such as citrus trees and grapes. "The new sachet packaging can be hooked to branches or stems," explained Mr Nakamura. "In addition, the mites are protected as they are gradually released, allowing them to withstand negative environmental factors such as less food (target pest or pollen), low humidity, and spray chemicals."

SYNGENTA DECLINES INNOVOTECH SEED TREATMENT

Innovotech Inc. (**www.innovotech.ca**), a pioneer in the field of biofilm product development, has announced that Syngenta has decided not to pursue its Right of First Refusal for Innovotech's seed treatment product, *Agress*. "The product has shown excellent results in recently completed field trials that expand its potential uses to high-value added crops such as fruits, vegetables and pulses," said Ken Boutilier, president and CEO of Innovotech. "While we are disappointed with Syngenta's decision, the fact remains that *Agress* has consistently shown that it is highly effective as a treatment for controlling seed-borne pathogens and as a spray. As such, we look forward to working with other industry participants who have expressed interest, as we continue to seek regulatory approval from the US EPA."

Agress, a high oxidation state silver compound, addresses some major problems in agricultural crop protection related to the use of the important antibiotic streptomycin for the treatment of crop diseases. Streptomycin is used in human health and its use in agriculture has been banned in many countries, including Canada. Furthermore, in many regions where streptomycin is used to manage crop diseases, microbial resistance to the antibiotic is becoming increasingly prevalent, making it an ineffective disease management option in those regions. Innovotech say *Agress* has been shown to be at least as effective as streptomycin in preventing a number of bacterial diseases, without the environmental consequences.

SEED TREATMENT IS FASTEST GROWING CROP PROTECTION SEGMENT

A new market research report has been released, *Seed Treatment Market Trends and Global Forecasts (2011-2016)*, published by Markets and Markets. The report says that the global seed treatment market is the fastest growing segment of the global crop protection market. (**www.marketsandmarkets.com/Market-Reports/seed-treatment-market-503.html**). The report states that the global seed treatment market exceeded $2250 million by the end of year 2010, and is expected to reach $3430 million by 2016, growing at a compound annual growth rate (CAGR) of 13.5% from 2011 to 2016.

Chemical seed treatments currently control over 98% of the global seed treatment market. Bio-control seed treatments are quite small but the report suggests that growth of this segment will be at a faster pace than any other segment, due to government encouragement to reduce agrochemicals usage. Seed treatment insecticides accounted for over 52% of the global seed treatment demand in 2010, equivalent to $1170 million. This is projected to reach $1,591 million by 2016, growing at a CAGR of 11.4%. The seed treatment fungicide market is projected to reach $1247 million by 2016, growing more rapidly at a CAGR of 15.2%.

The North American market is expected to hold 22% of the global market share by 2016, based on an estimated CAGR of 16.4% due to higher acceptance of GM seeds for soybean and corn. The Asia-Pacific region is expected to show rapid growth due to the strong push by government bodies for adoption of seed treatments with their '100% seed treatment campaign'. The market share of Asia-Pacific is expected to grow from $157.5 million in 2010 to $248.2 million by 2016, at an estimated CAGR of 14.4% from 2011 to 2016.

SYNGENTA LICENSES TECHNOLOGY FROM TWO BLADES FOUNDATION

The Two Blades Foundation (2Blades) (**www.2blades.org)**, a not-for-profit corporation dedicated to developing durable disease resistance in agricultural crops, has entered a non-exclusive license agreement with Syngenta. This provides Syngenta with access to Transcription Activator Like (TAL) effector Code technology for commercial uses in certain crops. TAL enables a number of highly useful tools, including designer TAL effectors (TALEs) for targeted gene activation or repression, targeted engineering of genomes to add, remove, or alter genes, and site-specific gene insertion. Successful implementation of such technology could lead to more efficient modification of beneficial genes in plants, which would enable more productive crops in the future. Syngenta will grant 2Blades access to

its improvements to the technology for use in 2Blades' humanitarian efforts to support subsistence farming. Syngenta will also have an option to expand its crop rights in the future.

The TAL Code technology, discovered by Ulla Bonas, Jens Boch, Thomas Lahaye, and Sebastian Schornack at Martin-Luther University in Halle, Germany, provides a novel, easy method for engineering proteins that bind to specific DNA sequences to precisely modulate genomes. 2Blades Foundation holds exclusive rights to commercial use of the technology in plants. "2Blades is committed to facilitating broad application of the technology in both the commercial and public sectors," said 2Blades COO Diana Horvath. "We are delighted that Syngenta will apply TAL Code technology to advance precision genome engineering in crops." Michiel van Lookeren Campagne, head of Biotechnology for Syngenta, added, "Syngenta is pleased to gain access to this exciting new technology, which we believe has the potential to revolutionise the way traits are engineered in crops. Collaborations such as this will enhance Syngenta's ability to help farmers grow more from less."

DUPONT'S FOOD SECURITY GOALS

Responding to the challenge of global hunger, DuPont has announced its goals for the company's contribution to help improve food security around the world. "No one company, country or non-profit organization can meet the challenge of feeding the world alone. But each of us can commit to doing our part and hold ourselves accountable to make a meaningful contribution to this global challenge," said Ellen Kullman, DuPont chair and CEO. "Establishing specific, measurable goals for what we can do to address that challenge is key to turning talk into results."

DuPont's food security goals, which address innovation, education and rural community development, will be tracked along with DuPont sustainability goals. DuPont says it was one of the first companies to establish sustainability goals in the 1990s and has consistently surpassed its commitments. The DuPont food security goals, to be achieved by the end of 2020, include:

- **Innovating to feed the world**

DuPont says it is investing $10 billion in research and development and introducing 4,000 new products centered on producing more food, enhancing nutrition, food and agriculture sustainability and safety; boosting food availability and shelf life; and reducing waste.

- **Engaging and Educating Youth**

The company is facilitating two million engagements with young people around the world in educational opportunities.

- **Improving Rural Communities**

DuPont intends to improve the livelihoods of at least three million farmers and their rural communities through targeted collaboration and investments that strengthen agricultural systems and make food more available, nutritious and culturally appropriate. This is in addition to the work already being done to enhance the lives of hundreds of millions of farmers through DuPont's normal business practices.

The DuPont food security goals were developed following a report issued last year by the DuPont Advisory Committee on Agriculture Innovation and Productivity for the 21st Century, chaired by former US Senator Thomas A Daschle of South Dakota. He says: "I'm pleased that DuPont is marshalling its resources to address key issues from the committee's findings. We need to follow the lead of organisations like DuPont, who commit to doing something about global food security, because they know hunger is at the heart of all other global issues."

CONFERENCE AND FEATURES

BAYER ADDRESSES POPULATION CHALLENGES

Dr Joachim Schneider, senior vice president for Growth & Strategy for Bayer CropScience, has spoken at a number of business panels about Bayer's initiatives to address the challenges posed by population growth, the growing demand for food, feed and renewable raw materials, limited natural resources and climate change. The panels - the Global Forum for Food and Agriculture (GFFA) and the AGCO Africa Summit were held in Berlin as part of International Green Week.

Dr Schneider outlined three critical areas. These, he said, were: supporting farmers to increase the agricultural productivity of the world's most important staple crops wheat and rice; closing the gap for small-scale farmers in Africa and beyond through the introduction of sustainable modern technologies; and accelerating the phase-out of all remaining WHO Class I insecticide formulations by the end of 2012, as announced in September 2011.

"Our entire organisation is focused to propel the future of agriculture through sustainable solutions based on seeds, traits and crop protection products," said Dr Schneider. "We are uniquely positioned to connect the dots, working together with everyone along the entire food value chain from seed to shelf." Bayer CropScience is planning to raise its research and development budget by some 20% to more than €850 million by 2015. "We must continue to commit to innovation to safeguard food security and to address poverty reduction," he said.

However, appropriate regulatory and political frameworks are necessary to increase world agricultural production sustainably. "As a company we depend on predictable and reliable business conditions. Good governance, sound and stable economic and political institutions and the rule of law are essential to create a favourable business environment attracting long term investment and allowing for sustainable growth," he continued.

Dr Schneider emphasised the urgent need for a sustainable introduction of modern technologies and local adaptation of tailored solutions with focus on small-scale farmers in Africa. He said that the lack of access to production factors like land, fertilisers, high-quality seeds, innovative crop protection solutions, feed and farming tools negatively affects agricultural production. "Closing this gap will allow African farmers to boost productivity. Rural development is the right way to food security, economic growth and social welfare of African countries." He pointed out that projects and initiatives need to be complementary rather than competitive to address the nexus of food, water, energy and soil. Bayer's engagement in Africa dates back to the early 1920s. Today, Bayer is present in 25 African countries, and has helped spearhead an important public private partnership (PPP) project. Since 2006, Bayer CropScience has been supporting small-scale farmers in Kenya, helping them reach demanding quality and food-safety standards. The 'Green World' project, one of roughly 240 food chain partnership projects Bayer has initiated worldwide, is based on the concept of providing local traders with intensive training by experts from Bayer CropScience.

Crop protection innovations are an important prerequisite for the sustainable development of agriculture. Bayer CropScience's product portfolio is constantly being rejuvenated through the company's research and development efforts so that it meets the needs of customers and fulfills the requirements imposed by changing cultivation and market conditions.

SUGAR BEET PEST AND DISEASE CONTROL

The annual UK sugar beet conference Closing the Gap *organised by the British Beet Research Organisation (BBRO), and held in Peterborough on 25 January, attracted nearly 700 growers and industry delegates. Bruce Knight attended and reports on new developments in pest and disease control.*

Dr Mark Stevens, head of crop protection at Broom's Barn Research Centre, Suffolk described how a new strain of the Rhizomania virus had spread in Eastern England in 2011. Rhizomania is generally kept under control as 85% of the sugar beet area in the UK is planted with resistant varieties. However, Mark Stevens stressed that it still remained a threat. The soil borne virus is more prevalent where the interval between successive sugar beet crops is short. There are also host crops other than sugar beet. Broom's Barn had carried out sampling in 2011, concentrating on fields planted to susceptible varieties. Although the dry spring in 2011 meant that Rhizomania development was less likely, 28 out of 30 samples taken proved positive and across all sugar beet growing regions. Of greater concern has been the detection of the resistance breaking AYPR strain. Four locations in Suffolk and Norfolk showed the new strain to be present in 2011. Root samples taken from the centre of the infestation patch yielded up to 60% less compared with the healthy part of the field. Sugar content was also reduced. Broom's Barn is exploring the feasibility of using aerial imagery to detect and monitor Rhizomania patches. Plant breeders are aiming for enhanced resistance in new varieties but an assessment of the genetics of the new strain is needed to help focus the breeding programmes.

Mark Stevens also described how beet cyst nematode (BCN) is a developing threat across all UK sugar beet factory areas. The adoption of tolerant varieties provides strategic options to limit the spread of BCN and protect yields. However, there is work underway at Broom's Barn that involves the experimental production of sugar beet in boxes with introduced soil samples from infested nematode infested fields. Through these studies it is possible to define the pest threshold for different varieties and genetics and to assess the buildup of BCN.

The impact of pests and diseases on sugar beet productivity in the Netherlands was described by Bram Hanse of the Institute of Sugar Beet Research (IRS) in Bergen op Zoom. A project commenced in 2005 under the title *Speeding Up Sugar Yield* (SUSY). This was initiated with the objective of increasing the average national sugar beet yield by 15 tonnes/ hectare by 2015 and reducing costs by €15 per tonne. IRS researchers selected and compared management methods of neighbouring growers. The survey was based on 26 pairs of growers. The 'top growers' were from the best 25% growers in the region and the 'average growers' were from the 50% or so average growers. Sugar yield differences between the two were as high as 15 tonnes/hectare. From the data collected the reasons for the differences were assessed. The sowing date accounted for 14% of the sugar yield, weed control, 30% and soil structure 25%. But the most significant factor was pest and disease incidence which accounted for 50% of the difference.

It was found that with 'top growers' infestations of BCN, beet necrotic yellow vein virus BNYVV (the virus associated with Rhizomania and fungal diseases) were lower. Although 70% of sampled fields were infested with BCN, there were more fields which were not infested amongst the 'top growers'. Sowing date was an important factor throughout. Bram Hanse concluded that yield improvement can be achieved independently from total variable costs. The main differences in yield are attributed to how and when the field management activities are carried out and what they consist of.

Colin MacEwan, head of BBRO, set out the UK industry's target for yield improvement. This is to increase average yields by 4% per year over the next four years. BBRO are looking to establish a centre of excellence for the practical application of new research developments at Broom's Barn Research Centre. Professor Maurice Moloney, director at Rothamsted Research (of which Brooms Barn is part), explained that in future the focus of research into sugar beet would be on genetics and systems biology because of the longer term benefits that they will offer.

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