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international news, comments, features and conference reports

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LEAD ARTICLES

EU FACES CHALLENGE OVER APPROVAL TO IMPORT GM SOYA

The Monsanto GM soya bean, which offers both insect-resistance and glyphosate-tolerance, *Intacta RR2 Pro*, was first cleared for production in Brazil in 2010. The EU finally gave permission for the use of imported *Intacta* soybeans in food and feed at end of June 2012. Brazilian producers are now looking to this as a major opportunity (*July CPM*). However, a number of European organisations, mainly based in Germany, all of which are against the adoption of GM technology, have challenged the basis on which the EU approval was granted. They claim that the European Food Safety Authority (EFSA) has not carried out the necessary risk assessments for *Intacta* in the way required by law.

The European Network of Scientists for Social and Environmental Responsibility (ENSSER) and Testbiotech have now filed a complaint to the European Commission. Other complainants include the Society for Ecological Research, Sambucus, the foundation Manfred-Hermesen-Stiftung for Nature Conservation and Environmental Protection and the Foundation on Future Farming. Statements attributed to Christoph Then, of Testbiotech (www.testbiotech.de), say: "EFSA is assessing the risks of genetically engineered plants very superficially by just applying a simplified procedureIn addition, the commission is not fulfilling its duty to control market authorisations." Mr Then argued that the current procedure is in contradiction to existing EU regulations. His complaint is intended to put pressure on the Commission and the EFSA to give much more weight to the protection of consumers and the environment.

Mr Then continued: "The data analysis of risk assessment as performed by EFSA shows that crucial points such as allergenic risks and combinatorial effects were not taken into account sufficientlythis may cause a high level of risks for the consumers." Amongst the arguments put forward by the complainants has been the lack of data from the possible interaction between the glyphosate and the *Bt* insecticide in the plant. It is also claimed that a number of documents produced by EFSA emphasise the need for specific risk assessment of genetically engineered plants for groups of consumers who are more susceptible to allergic reactions and that this factor has been disregarded.

The complainants also point out that the commission did not request post marketing monitoring of health effects as required by EU regulations. They also argue that although the major use of soybeans in the EU is for animal feed the approval is also given for human food uses. So producers of baby food could change their standards and use genetically engineered soybeans without needing any further permission. Mr Then commented: "This is why EFSA must assess these risks before any market authorisation can be given."

OUTGOING SCIENCE CHIEF CALLS FOR MORE GM RESEARCH

The outgoing chief scientific adviser for the UK has recently questioned his former bosses' commitment to GM technology. Professor Robert Watson, who is due to leave his post at the Department of Environment, Food and Rural Affairs (Defra) next month, highlighted the need for more 'credible' research into GM technology, but added that more funding was crucial. He said a lack of financial stability in the sector, coupled with the devolved nations' unwillingness to agree a policy on GM, was creating a barrier to new scientists entering the industry. The Scottish and Welsh Governments are standing firm in their opposition to the cultivation of GM crops. Professor Watson said there had to be some 'meeting of the minds politically' before the case for GM could move forward.

Professor Watson said: "My view is consistent with the English Government's view, not the UK Government's. We need to do more research and open, transparent field trials and then say what the risks and benefits of using GM products are, versus other products. "This could relate to increasing wheat yields, reducing fertiliser use, increasing disease resistance or making crops more drought or flood resistant - something farmers have had a problem with in the last nine months." Professor Watson, who has spoken extensively on how to increase UK food production sustainably and the challenges of climate change, said more money needed to be ploughed into research so a 'sound, solid' case could be presented to the public.

"At the end of the day, the public is probably not going to accept GM if it cannot see a benefit. We need credible research so we can make some sound political decisions." But Professor Watson said it

was this slow decision-making process which was hindering the industry, because young scientists were reluctant to enter the field of GM research when its future was so uncertain. “There’s only been one product in the last 10 or 15 years. I can see people asking, ‘Do I want to get into GM if it is not ever going to go anywhere?’ There is a general acceptance we have not attracted the good, bright scientists to transitional or applied research. Defra and the Biotechnology and Biological Sciences Research Council (BBSRC) are not funding it well.”

EUROPEAN NEWS AND MARKETS

GM POTATO TRIALS SHOW PROMISE

Early results from the third year of trials carried out by the UK's John Innes Centre show that GM potatoes remained healthy while traditional potatoes planted alongside suffered from blight. In a recent news report Professor Jonathan Jones, a research leader in the Sainsbury laboratory, was quoted as saying the GM potato was successfully combatting blight under the worst attack for years. The trial, funded by the BBSRC, was based on 192 plants and has been repeated for the last three years. The blight resistant gene, identified from a wild potato relative, *rpi-vnt1*, was introduced into Desiree potatoes by scientists in the Netherlands. Professor Jones reported that the resistant varieties seemed to be withstanding the pressure while non-GM plots of Maris Piper and Desiree had been infected and seriously damaged by blight. The project team plans to submit a report on the trials for publication in the *Proceedings of the Royal Society* once the results have been fully analysed.

The trial in Norfolk, which cost £20,000 (\$32,000), was conducted inside a three metre high security fence. The potatoes will be destroyed once the trial is completed and will not enter the food chain. It is hoped that the trial will lead to the development of a pipeline of blight resistant genes to protect the most popular commercial varieties against late blight. Professor Jones commented: "Our current plan is to seek more funding to put blight resistance and other useful traits into Maris Piper which is the most favoured variety in the UK". Maris Piper accounts for about 15% of national production. Total annual expenditure on blight control by growers in the UK averages around £60 million. Globally annual losses are reported to amount to £3.5 billion.

Trials with blight resistant potatoes incorporating the same resistance gene were started in Ireland in July (*July CPM*). It has been reported that a group of campaigners, including Irish Green Party leader Eamon Ryan, are seeking a legal challenge over a decision to allow this trial. The group is seeking approval from Dublin's High Court to make a legal case on the basis of the provisions of the recently ratified Aarhus Convention. Article nine of the convention requires that people have the ability to challenge critical environmental decisions without facing the threat of large legal costs.

FRANCE UPHOLDS BAN ON THIAMETHOXAM

The appeal put forward by Syngenta against the French ban of the oilseed rape seed treatment, thiamethoxam, (*July CPM*) has been rejected. The Versailles Administrative Court rejected Syngenta's legal challenge to the nation-wide ban of *Cruiser* OSR seed treatment, which contains the neonicotinoid insecticide. After a long and well-publicised legal dispute, the French ministry of agriculture introduced the ban in late June, following the release of a number of scientific studies linking neonicotinoid pesticides including *Cruiser* with colony collapse disorder in bees.

A Syngenta spokesperson was reported as saying that the company was "disappointed" and claimed studies by French health and safety agency ANSES and the European Food Safety Authority (EFSA) had both failed to conclusively identify a link between its product and the health of bee populations. However, EFSA suggested in May that current tests of agricultural chemicals may be deficient in several key areas and called for tighter regulations and stricter testing to save Europe's dwindling pollinator populations. One argument put forward by crop protection companies is that the destruction of pollinators' natural habitats and diseases is caused and exacerbated by varroa mites. This particularly applies to bees, and although conservationists admit that varroa mites have a large part to play in the decline of certain bee species, they also point out that varroa mites do not affect some species of bee and other insect pollinators including butterflies, and yet these species are also in decline.

BAYER ACQUIRES NEW WHEAT BREEDING STATION IN FRANCE

Bayer CropScience has acquired a new wheat breeding station in Milly-la Foret near Paris, France, from the privately-owned company RAGT Semences SAS. The station, situated in one of the key wheat regions in France, comprises approximately 77 hectares of land and an additional 100 hectares in leased property as well as greenhouses and laboratories. Bayer is building a leading global wheat breeding programme by selecting for outstanding agronomic properties in a broad pool of local and global breeding materials. "We are focused on increasing yields in wheat and adapting new varieties to existing environmental challenges," said Dr Mathias Kremer, head of the BioScience business unit at Bayer CropScience. "The new breeding station in France will enable us to deliver solutions to wheat farmers more rapidly by tapping into our global network of experts, tools like molecular breeding as well as working closely with local partners and farmers." Breeders are also developing new varieties

with improved tolerance to abiotic stresses like drought and heat as well as with an improved resistance to fungal diseases. Another important criterion is the grain quality. The introduction of Bayer's first wheat varieties in France is expected by the end of the decade.

SYNGENTA RECEIVES UK APPROVAL FOR OILSEED RAPE HERBICIDE

Syngenta has received UK approval for its residual herbicide *Teridox* for use in oilseed rape crops this autumn. Containing the active ingredient dimethachlor, it is seen as a product that can complement or replace metazachlor and provides activity on a range of grass and broad-leaved weeds. "The highly competitive chickweed, red dead-nettle, mayweeds and groundsel, for example, are extremely well controlled," said Chris Charnock, oilseed rape technical manager at Syngenta. Used widely across continental Europe in pre-formulated mixtures, the availability of the active as a straight will give UK growers and agronomists flexibility to use *Teridox* in tank mixes tailored to individual situations, Mr Charnock explained. Currently approved as a pre-emergence herbicide only, the popularity of the product will be dependent on how the cost compares with other pre-emergence options. The product will be marketed this season by two UK distributors, Agrovista and Hutchinsons.

TURKISH APPROVAL FOR EXOSECT'S GRAPE VINE MOTH CONTROL

Exosect (www.exosect.com) has announced that its unique pheromone technology has received registration for use on Grape Vine Moth (*Lobesia botrana*) in Turkey. This follows the recent approval for Oriental Fruit Moth (*Grapholita molesta*) in Italy and launch of Codling Moth (*Cydia pomonella*) in France earlier this year. *Exosex* is a unique pheromone technology which controls moth pests in agriculture, horticulture and food manufacturing. Grape Vine Moth is a major global pest of grapes throughout Europe, North and West Africa, the Middle East, eastern Russia and Japan. *Exosex* uses *Entostat*, the company's patented delivery platform, which delivers and disseminates minute quantities of the female sex pheromone throughout the Grape Vine Moth population, and this in turn prevents mating and subsequent fruit damage. These products form part of a suite of mating disruption products which Exosect has developed using the technology. These are now registered in the UK, France, Italy, Portugal, Greece, Netherlands, Belgium, Denmark, Austria, Slovenia, Turkey, USA, South Africa, Australia, New Zealand and India.

AMERICAN NEWS AND MARKETS

CHEMINOVA RECEIVES APPROVAL FOR FUNGICIDE IN BRAZIL

Cheminova has received approval for *Authority* in Brazil for the control of fungal diseases on several crops. The fungicide is a new unique mixture based on the active ingredients azoxystrobin and flutriafol. The new registration allows Cheminova to recommend the product for use in soybean in addition to wheat, cotton, and coffee. Label extensions for more crops are expected in the coming years including corn, beans and banana. *Authority* is to be marketed throughout Brazil to large distributors, co-operatives and soybean, cotton, coffee and wheat growers. Soybeans are grown all over Brazil, whereas cotton is mainly grown in the north and wheat primarily in the south due to climatic conditions.

With azoxystrobin coming off patent, Cheminova decided several years ago to introduce products based on this active ingredient by developing its own formulations and mixtures in addition to production processes. Cheminova's first registration for azoxystrobin was obtained end of 2011 in Colombia when approval was granted for the straight formulation *Azaka* for use on rice, onions and bananas. In Taiwan and South Africa the company has also obtained registrations for straight azoxystrobin. The first registration for the mixture with flutriafol was obtained in Belarus at the end of 2011.

FMC AND KUMIAI EXPAND PYROXASULFONE COLLABORATION

FMC has expanded its development and distribution agreement with the Japanese company Kumiai Chemical Industry to extend access to the herbicidal active ingredient pyroxasulfone (KIH-485). This will allow FMC to market and sell new premixes containing pyroxasulfone and FMC proprietary chemistries for a variety of crops, including cotton, peanuts, potatoes, vegetables and wheat. "As part of the FMC North American Crop business strategy, it is our goal to build successful key alliances," said FMC director of business and product development Neil DeStefano. FMC is in the process of developing new premix concepts and reports positive and exciting results. It anticipates that it will have new products for launch starting in 2014.

FMC ANTICIPATES EPA APPROVAL OF TWO NEW HERBICIDES

FMC is anticipating US EPA (Environmental Protection Agency) approval of two new herbicides, *Anthem* and *Anthem ATZ* for corn in late 2012. The new active ingredient in *Anthem* is Kumiai's pyroxasulfone. The other active ingredient is fluthiacet-methyl. FMC says the new herbicides are the result of several years of planning, research and development. A preplant, preemergence and early postemergence herbicide for corn, *Anthem* has two different modes of action, providing an excellent weed management tool for broad-spectrum weed control, resistance management and a lower use rate range. *Anthem ATZ* also contains atrazine and is a patent-pending formulation that mixes and handles easily.

"*Anthem* brand herbicides offer better control with longer residual action than traditional preemergence herbicides," said FMC product manager Rick Ekins. "They could set a new standard for broad-spectrum, long-lasting grass and broadleaf weed control in corn. Use rates are approximately four times less than traditional residual corn herbicides and studies show that *Anthem* performs exceptionally well at these low rates," added Mr Ekins. There were more than 90 research test plots in 2012 across a broad geography on a wide range of soil types and in both irrigated and non-irrigated crops. Both *Anthem* and *Anthem ATZ* have demonstrated excellent crop safety.

DOW LAUNCHES POWERCORE IN ARGENTINA

Dow AgroSciences has launched *Powercore* in Argentina for the control of major corn pests. The innovative technology combines two herbicide-tolerant genes plus three genes resistant to pests of economic importance to Argentina and is the first product approved in Argentina with five genes stacked in corn. The trait incorporated into Dow AgroSciences' hybrid portfolio will be available for sale in late 2012 in Argentina and Brazil. *Powercore* will provide increased corn yield between 5% and 10% depending on the technological level of crops and weather conditions. "The launch of *Powercore* in Argentina is a significant milestone for our Latin American corn business and is aligned with Dow AgroSciences commitment to continue the introduction of novel biotech products globally," said Rolando Meninato, global leader, Seeds, Traits & Oils, for Dow AgroSciences.

Through its multiple modes of action, *Powercore* combines the control of major corn pests, such as Fall Armyworm (*Spodoptera frugiperda*), Sugarcane Borer (*Diatraea saccharalis*), Corn Earworm

(*Helicoverpa zea*), Corn Stalk Borer (*Elasmopalpus lignosellus*) and Black Cutworm (*Agrotis ipsilon*), and tolerance to two types of herbicides - glyphosate and glufosinate. *Powercore* gives Argentinean corn growers another benefit because the refuge area is reduced to 5% instead of the traditional 10% refuge recommended for other technologies.

MARRONE ACQUIRES NEW MANUFACTURING FACILITY

Marrone Bio Innovations (MBI) has acquired an 11,400 square foot (1,060m²) manufacturing facility on 11 acres (4.45ha) in Bangor, Michigan. The new facility will provide MBI with the necessary capacity to develop its growing pipeline of biopesticides for the agriculture and water treatment markets. "This marks a significant milestone for MBI," said CEO Pam Marrone. "Having our own manufacturing facility will be a tremendous asset to us – both in terms of cost effectiveness and quality assurance for our existing products and as we seek to rapidly advance our pipeline of new products from development to commercialisation." The site is formerly a biodiesel production facility. MBI will begin retrofitting the facility for fermentation this month, and intends to initiate manufacturing in early 2013. In addition to the manufacturing plant, the site includes offices and a laboratory. The facility will initially employ 20-30 people, and MBI intends to increase employment to 50 workers over the next few years.

MBI anticipates manufacturing at the new facility *Grandevo*, a broad-spectrum bioinsecticide for controlling insects and mites, as well as *Zequanox*, the industry's first naturally derived product for controlling invasive zebra and quagga mussels. In addition MBI has several early stage products that if developed will ultimately be manufactured in Bangor. Those include a novel EPA-approved bioherbicide and an additional insecticide, currently undergoing EPA review. Additionally, the company has several nematocides, herbicides, fungicides, algacides and plant health product candidates under development that could be produced at the site.

MONSANTO'S \$1 BILLION AWARD AGAINST DUPONT COULD BE TOO HIGH

Many legal commentators believe that the patent infringement award of damages for \$1 billion granted to Monsanto from DuPont Pioneer, relating to GM soybean developments, could be vulnerable because of the size of the damages. DuPont has already declared its intention to appeal (*July CPM*). It intends to focus on the Monsanto patent, the amount of damages and 'fundamental errors' in the case.

The award agreed on 1 August by a federal jury in St Louis was the fourth largest patent verdict in US history. But as two of the three awards that exceeded the figure were thrown out on appeal and the third was cut by almost two-thirds after a settlement, there is a strong precedent for the value of the award being reduced. John Dragseth, a patent lawyer with Fish & Richardson in Minneapolis, is reported as saying: "No court is going to let a billion dollar verdict stand without a hard look." Another patent lawyer from Minneapolis, Warren Woessner, who specialises in biotechnology patents at Schwegman, Lundberg & Woessner, said: "I am startled by the size of the verdict in the absence of any commercial sales. Infringement has historically been found in cases like this, but there are no damages awarded."

According to Monsanto, DuPont infringed the *Roundup Ready* patent six years before its expiration due in September 2014. DuPont has never sold soybeans based on the patent, but it was argued that DuPont would have expected to generate \$3 billion of revenue which translates into \$800 million to \$1 billion in damages to Monsanto. Oskar Liivak is an associate professor at Cornell Law School in Ithaca, New York specialising in intellectual property. His interpretation was that the jury determined the \$1 billion award by calculating a reasonable royalty rate from the time the infringement was said to begin. Monsanto stated at the trial that DuPont had rejected an offer of a \$1.5 billion license. Mr Liivak added: "The fact that DuPont ultimately never sold the seed was not relevant for the reasonable royalty calculation and, as the damages showed, that reasonable royalty added up to a rather large figure."

DuPont will get a chance to make its arguments first to US District Judge Richard Webber, who presided over the trial. Whichever side loses may then seek review before the US Court of Appeals for the Federal Circuit in Washington. According to Mr Woessner an appeal by DuPont may force the Federal Circuit court to decide where the line is between permissible experimentation to improve upon an invention, and a violation of a patent owner's right to exclude others from using it. The largest US patent verdict to date which was upheld on appeal amounted to \$200 million that then grew to \$300 million with added royalties and interest. The award was against Microsoft Corporation over a feature in Word, part of the Office software used by more than one billion people.

TEMPORARY HALT TO PERMISSION TO GROW GM CANOLA IN OREGON

The Oregon Court of Appeals has ordered a temporary halt to the state's plan to allow GM canola to be planted in parts of the Willamette Valley in Oregon. The order will apply until the court rules on a lawsuit filed by opponents of the GM canola planting who say it threatens the state's \$32 million specialty seed industry. Oregon Department of Agriculture (ODA) had removed a 2009 rule that banned the planting of all canola on more than 1.2 million hectares in the Willamette Valley which was aiming to prevent cross pollination with speciality vegetable seed crops. The ODA had specified that it would require GM canola and speciality seed producers to report where and what they intended to grow on 0.7 million acres in the restricted zone. The GM canola harvest was to be earmarked for biofuel production. ODA director Katy Coba stated in the Department's press release in early August: "Since canola has been deregulated by USDA, ODA does not differentiate between conventional and GM canola or treat them differently."

As 93% of US planted canola crops are genetically modified opponents argue that the planting of GM canola would present a large threat to the integrity of Oregon's internationally recognised organic seed industry. The lawsuit seeking to prevent the ODA from agreeing to the planting of GM canola in previously protected zones was filed in mid August in the Oregon Court of Appeals. The Court found sufficient cause to order an immediate halt to planting, subject to further judicial review. Molalla, the Oregon-based Friends of Family Farmers, filed the suit together with the Centre for Food Safety, a national sustainable agriculture organisation. Also supporting the lawsuit were Oregon specialty seed producers Universal Seed, Wild West Seeds and Wild Garden Seed.

NEW WATERHEMP RESISTANCE TO 2,4-D IDENTIFIED IN NEBRASKA

Waterhemp (*Amaranthus rudis*), now a major weed problem in the US Midwest, is one species proven to have developed resistance to glyphosate in Minnesota and neighbouring states. A paper just published in the journal *Weed Science* by scientists at the Weed Science Society of America reports on the discovery of 2,4-D-resistant waterhemp in Nebraska. After 10 years of treatment of a Nebraska native-grass seed production field with 2,4-D, waterhemp was no longer effectively controlled, the report said. The highest doses of 2,4-D that were used in an on-site field study were insufficient to control 50% of the waterhemp population. Researchers gathered waterhemp seeds from this field and performed greenhouse testing against a susceptible waterhemp variety. Twenty-eight days after treatment with the herbicide, visual observation and dry weight values showed a 10-fold resistance in the affected sample.

Farmers routinely use 2,4-D to control weeds in grassland and crop production. Its effectiveness has largely held up although it has been in use since the 1940s. Only 17 weed species had previously been reported to it. Waterhemp is one of the so called 'superweeds' showing resistance to glyphosate. Dow AgroSciences have been seeking federal regulatory approval to use a 2,4-D based herbicide on glyphosate tolerant corn, soybeans and cotton in order to control the glyphosate resistant weeds.

CANADA RE-EVALUATES LINURON USES

After a re-evaluation of the herbicide linuron, the Canadian Pest Management Regulatory Authority (PMRA) is proposing to phase out the sale and use of all linuron products in Canada. This is because an evaluation of available scientific information found that, under the current conditions of use, the human health and environmental risks estimated for linuron do not meet current standards. Linuron is a key herbicide for both carrot and potato production in Canada. Furthermore, 25 new uses of linuron are identified in the Canadian Grower Priority Database (a database of priority needs for registration of new uses identified by growers) and many of them are identified as 'high priority and no alternatives'.

Based on the PMRA's records, a total of eight linuron products are registered under the authority of the Pest Control Products Act, including three technical grade active ingredients and five commercial class end-use products. Of the five commercial class end-use products, three are formulated as suspensions and two as wettable granules (one of which is in water soluble bags). No domestic class end-use products containing linuron are registered in Canada. Stakeholder feedback to date suggests linuron is a key use in carrot and potato production and a future priority in herb and spice production. The number of alternatives for use on some of the minor crops is very limited. Due to the risk concerns identified, mitigation measures and refinements were considered in the aggregate assessment. However, even with the use of refined estimates based on the mitigation scenario where all crops except those with the lowest rates (wheat, barley, and oats) are removed, the aggregate exposure from food and drinking water remains of concern. The PMRA also considers linuron poses risks to both terrestrial and aquatic organisms. The authority says it will accept public comment for this proposed re-evaluation decision until 25 September.

OTHER NEWS AND MARKETS

SYNGENTA ACQUIRES DUPONT INSECTICIDE BUSINESS

Syngenta is to acquire the DuPont Professional Products insecticide business. The acquisition will expand the range of products which Syngenta offers to golf course and lawn care professionals and to ornamental growers, and will also strengthen its portfolio for the control of pests in the home. Under the terms of the agreement, Syngenta will acquire a global business including established pest control brands *Advion* and *Acelepryn* (chlorantraniliprole) and other intellectual property, as well as a number of employees, for \$125 million. Syngenta will also access related active ingredients and formulated products from DuPont through exclusive supply and licensing agreements. Robert Berendes, head of Syngenta's business development, said: "This acquisition will contribute to our objective of increasing profitability in the Lawn and Garden business through a focus on integrated solutions for our customers based on high value chemistry and genetics. The products we are acquiring have an excellent environmental profile while providing superior control of insects in a wide variety of applications." The transaction is expected to close in the fourth quarter of 2012.

BAYER AND MENDEL TO COLLABORATE ON NOVEL HERBICIDES

Bayer CropScience and Mendel Biotechnology, Hayward, California, US have announced a new multi-year collaboration to jointly identify herbicides with novel modes of action. They say that increasing evidence of herbicide-resistant weeds in different geographies – including those resistant to multiple herbicide classes – has spurred renewed interest in the discovery of herbicides. Bayer CropScience, currently the global No. 2 in herbicides, will bring in its leading expertise in herbicide research and development while Mendel will provide knowledge of plant genetic regulatory networks (PGRNs) and its suite of proprietary genetic tools and assays for understanding plant development.

"There is a major need in agriculture for herbicides acting through novel modes of action," noted Dr C David Nicholson, global head of Research & Development at Bayer CropScience. "We believe that this collaboration will help us continue our significant contributions in agricultural chemistry and will further strengthen our partnering to cultivate new ideas and answers to help growers to tackle weed resistance issues and to protect their crops." "We are excited to expand our partnership with Bayer CropScience into this new area of herbicide discovery," said Dr Neal Gutterson, Mendel's president and CEO. "This collaboration is recognition of the broad applicability of Mendel's core technology platform and know-how in various fields across agriculture, and another important step towards realisation of our new open architecture business strategy."

BAYER TO ESTABLISH NEW BREEDING CENTRE IN AUSTRALIA

Bayer CropScience plans to establish a new breeding centre in the Wimmera region in Western Victoria, Australia that will focus on wheat and oilseeds. The company plans to invest around €12 million (A\$14 million) and will target the development of new varieties with higher yields and productivity improvements tailored to Australian conditions. Bayer's breeding activities for wheat and oilseeds in Australia will also be coordinated from the new centre. A long term rental agreement for land on which to build the laboratory and glasshouse facilities have been agreed with Longerenong College and Workco Ltd. Up to 20 full-time employees will be based at the centre in the future.

"With the demand for wheat and oilseeds growing worldwide, we are driving our efforts towards producing new high-yielding varieties that are better able to withstand pests and, diseases, and able to thrive under environmental stresses like drought," said Dr Mathias Kremer, head of the BioScience business unit at Bayer CropScience. "We are convinced we can help make wheat and oilseeds farmers in Australia and beyond more productive and sustainable." Australia is one of the largest exporters of agricultural products and ranks as the third largest exporter for wheat and the second largest for oilseeds.

Construction of the new centre will commence in the coming months and the first local breeding programmes are expected to yield results for Australian farmers within the decade. Bayer says that about 25% of the world's agricultural land is used to grow wheat, making wheat the most widely grown crop. In terms of cereal production volumes, wheat ranks second behind corn, with more than 650 million tons produced annually. Wheat productivity is growing at a rate of less than 1% annually, while the global demand is increasing twice as fast. Main wheat producing regions are Australia, the Black Sea Region, China, the EU, India and North America. The new breeding station will contribute to Bayer CropScience's global network of wheat and oilseeds breeding stations situated in key markets

through North America and Europe, with further expansion especially for wheat planned in Asia and Latin America in the medium term.

BASF EXPANDS ITS GREENHOUSE FACILITIES

BASF is expanding its greenhouse facility at its Agricultural Centre in Limburgerhof, Germany. The additional 1250m² add nearly 25% to the existing greenhouse research capacity for herbicides. In addition to supporting herbicide research the new greenhouse will aid investigations into how plants react to controlled stress factors such as water availability, nutrient deficiencies and temperature extremes. "Our researchers shape the future of not only our business but of agriculture as a whole," said Markus Heldt, president of BASF's Crop Protection division. "With this state-of-the-art facility, we can continue to ensure that farmers have the innovative, sustainable tools they need to meet present and future challenges. With climate-controlled seed storage, automated potting machines and conveyor system, the greenhouse seamlessly integrates all steps in the research trial process under one roof."

NUFARM TO ACCESS NEW FORMULATION TECHNOLOGY

Nufarm Limited and Starpharma Holdings Ltd have announced an agreement under which the two parties will apply Starpharma's *Priostar* dendrimer technology to develop innovative crop protection formulations for Nufarm's product portfolio. "We are very pleased to be working with Nufarm in this way," commented Dr Jackie Fairley, CEO Starpharma. "This agreement builds on previous collaboration between the companies and we are excited about the opportunity to work with Nufarm to develop innovative and improved products." "The collaboration reflects our renewed emphasis on technological innovation," said Lachlan McKinnon, Nufarm Australia's general manager. "We are seeking innovative ways to differentiate our products so that growers are offered a wider range of control options tailored to their particular needs." Dendrimers are a new class of polymeric materials with unique behaviour that have wide applicability in the agrochemical sector. Through its own internal research programme Starpharma has shown that the benefits of *Priostar* dendrimer technology to agrochemical formulators and end-user growers are more concentrated formulations, a reduction in solvent loading, improved activity and increased adhesion.

MAKHTESHIM AGAN REPORTS SALES INCREASE

Makhteshim Agan has reported that sales for the second quarter of 2012 totaled \$783 million, up 8.4% (11.2% excluding currency effect) compared with \$723 million in the second quarter of 2011. The increase reflected a rise in volumes sold, particularly in the Americas and in Asia Pacific together with higher selling prices that compensated for higher costs of raw materials, offset partially by the negative impact of fluctuating exchange rates. For the six-month period, sales totaled \$1,612 million, an increase of 7.3% (8.5% excluding currency effect) compared with \$1,504 million for the first half of 2011.

The quarter's strongest sales growth was delivered in Latin America, where revenues increased by 19.8% to \$137.3 million compared with \$114.6 million in the second quarter of 2011. This reflected the continued improvement in the company's Brazilian operations; this is in spite of draught conditions in Argentina. Sales in North America increased by 12.3%, reflecting a rise in quantities sold, partially offset by the erosion of selling prices as compared with the same period in 2011. Sales in Asia Pacific and Asia increased by 12.0% despite the challenging economic environment in India, reflecting the contribution of continuous product introductions and solid business performance in Australia, which offset the erosion in the value of the Indian rupee and other local selling currencies. Sales in Europe increased slightly despite the erosion of European currency rates, reflecting increased sales to North European countries.

EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortisation) for the second quarter of 2012 increased by 14% to \$136.1 million (17.4% of sales), compared with \$119.4 million (16.5% of sales) for the second quarter of 2011. For the six-month period, EBITDA totaled \$299.3 million (18.6% of sales), compared with \$262.7 million (17.5% of sales) in the first half of 2011.

Mr Erez Vigodman, president and CEO of Makhteshim Agan, commented: "Our solid results for the second quarter and first half of 2012, demonstrate the company's steady progress in line with our strategic objectives. We continue to build our position in key markets and to improve our customer focus and product portfolio differentiation, thereby achieving a steady improvement in our top-line and bottom-line performance. We have recently announced a number of organisational changes aimed at enhancing our commercial focus, and continue to conduct our ChemChina asset assessment in line

with our business integration plan. I am confident that these and other measures that we have been carrying out are positioning us to take the business to the next level in line with the new strategic direction we have set for ourselves and to accomplish our long term objectives.”

MONSANTO AND ALNYLAM FORM STRATEGIC ALLIANCE

Monsanto Company and Alnylam Pharmaceuticals have formed a strategic alliance to advance biological technologies in the field of agriculture. The new alliance brings Alnylam’s broad RNAi-based intellectual property (IP) and proprietary technologies to Monsanto’s new BioDirect technology, which aims to deliver innovative biological solutions for farmers. Under the terms of the agreement, Monsanto receives worldwide, exclusive rights to use Alnylam’s platform technology and IP in the field of agriculture, including the ability to grant sublicenses. Monsanto will pay Alnylam \$29.2 million in upfront payments. In addition, Alnylam is eligible to receive milestone payments and additional funding for collaborative research efforts. Alnylam is also eligible to receive royalty payments on products utilising its technology and IP. Moreover, Monsanto becomes Alnylam’s strategic partner in agriculture for a 10-year period.

“We are very pleased to form a partnership with Alnylam, a leading technology company with intellectual property and a technology platform that will support our work in agricultural biologicals introduced earlier this year with BioDirect technology,” said Tom Adams, vice president of Chemistry Technology at Monsanto. “We believe biological products have great promise in agriculture and we are excited to be collaborating with Alnylam in this area.”

RNAi (RNA interference) represents a breakthrough in understanding how genes are turned on and off in cells, and a completely new approach to drug discovery and development. RNAi is a natural process of gene silencing that occurs in organisms ranging from plants to mammals. By harnessing the natural biological process of RNAi it is possible to create a major new class of medicines, known as RNAi therapeutics.

MONSANTO APPOINTS NEW PRESIDENT

Brett Begemann has been named as Monsanto’s president and chief commercial officer. In his expanded role he will lead the oversight and operational execution of the company’s near-term expansion and growth in key international markets. Hugh Grant will continue to serve as the chairman and CEO, and will maintain ongoing responsibility for leading the company’s long-term corporate strategy, as well as setting direction and maintaining oversight of its operations. Mr Grant will continue to focus on the delivery of strategic plans and policies for the organisation, including the company’s long-term vision which is focused on producing more, conserving more and improving the lives of people throughout the world.

Mr Begemann, who joined Monsanto in 1983, has served in a variety of roles across sales, marketing and commercial development as well as senior management positions worldwide. He was previously Monsanto’s executive vice president and chief commercial officer for global business operations. In his expanded role he will work to ensure the commercial development of the company’s next generation growth drivers. These include growth in established markets as well as new markets like Eastern Europe, China and Latin America, as well as growth through the next wave of agriculture innovations such as Integrated Farming Systems and Ag Biologicals. Mr Begemann will continue to lead the global commercial business including overseeing the commercial, manufacturing and supply chain operations in row crops, vegetables and crop protection.

“Brett has served as a valuable contributor to Monsanto’s agriculture business for nearly 30 years, including leading our global organisation, implementing growth strategies both domestically and abroad, as well as delivering strong financial results to our business,” said Mr Grant. “His leadership has played an important role in accelerating the company’s growth potential and I expect that to continue as our business looks to deliver on the next generation of growth – both domestically and abroad.”

BIOPESTICIDE CONFERENCES

Informa Life Sciences is holding its annual Biopesticide conference 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.

(www.informa-ls.com/biopesticides)

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.

CONFERENCES AND FEATURES

THE US LEADS THE WAY IN BIOTECH CROP ADOPTION

The June 2012 United States Department of Agriculture (USDA) Crop Acreage Report shows near or complete optimisation of biotechnology in the three large acreage crops - corn, soybean and cotton. Some 88% of all maize, 93% of all soybean, and 94% of all upland cotton was planted to biotech varieties and hybrids featuring the two principal traits of insect resistance and herbicide tolerance. Dr Clive James, founder and chairman of the International Service for the Acquisition of Agri-biotech Applications (ISAAA) comments.

“Unprecedented high adoption rates are testimony to overwhelming trust and confidence in biotech crops by millions of farmers worldwide,” said Dr James. “Farmers are masters of risk aversion. As soon as biotech crops are commercialised, their adoption is rapid, leading to near or complete optimisation. The simple reason for the success of biotech crops in the US, and in another 28 countries around the world, is that they generate significant and multiple benefits by reducing yield loss from insect pests, weeds and diseases, and also result in substantial savings of pesticides.”

Since biotech crops were first commercialised in the US, and five other countries in 1996, millions of farmers in 29 countries worldwide have made decisions to plant and replant crops featuring the technology on an accumulated area of more than 1.25 billion hectares or three billion acres - an area of crop land 25% larger than the total land mass of the US. ISAAA data indicate that US farmers continued to plant more biotech crops than any country in the world in 2011 - a total of almost 70 million hectares or 170 million acres, of which half the corn area, and two thirds of cotton had more than one trait, generating multiple benefits. In addition to the three principal biotech crops the US also grew half a million hectares of sugar beet (95% adoption achieved in five years) and also biotech canola, alfalfa, squash and papaya.

The current drought in the US, that is badly affecting the corn crop, is generating increased interest in biotech drought tolerant corn which is currently being tested in extensive field trials. Drought tolerance is an infinitely more complex trait than herbicide tolerance and insect resistance and progress is likely to be on a step by step basis. Encouraging results in the US from the 2012 field tests on biotech drought tolerant corn would be a significant step forward to address drought, the most important constraint to increasing crop productivity globally, to which both conventional and biotech applications can contribute.

Dr James said that the expected plateauing trend to optimal adoption rates of around 90% that has been seen in the US has also been evident in other industrial countries like Australia with 99.5% adoption in biotech cotton. Similarly, as expected, the major biotech crops in the principal developing countries exhibit the same trend, again confirming the trust and confidence of farmers in the technology. Herbicide tolerant soybean has virtually reached 100% in Argentina and the latest ISAAA data for 2011 shows *Bt* cotton in India at 88%, and biotech soybean in Brazil at 83%. Given that products in mature markets are already plateauing at close to optimal rates, incremental annual growth in adoption will be more modest and will be boosted as additional hectares are planted, as was the case with total corn plantings in the US in 2012 (up 5%), and new traits or new biotech crops are approved, or new countries adopt biotech crops.

Dr James observed that of the 29 countries that had adopted biotech crops in 2011, 19 were developing countries and 10 were industrialised nations. China and India lead Asian adoption, Brazil and Argentina lead in Latin America and South Africa leads in Africa. The growth rate for biotech crops in developing countries was 11% or 8.2 million hectares during 2011. This was twice as fast and twice as large as industrial countries at 5% or 3.8 million hectares. Developing countries grew approximately 50% of global biotech crops in 2011 and are expected to exceed developed countries' land area devoted to the crops in 2012. Additionally, more than 90% of farmers planting biotech crops worldwide (equivalent to over 15 million farmers) are small resource-poor farmers in developing countries, up 8% or 1.3 million since 2010.

Dr James said that in the near term, the biggest driver of global biotech crop adoption will be Brazil followed by China, once approval to commercialise biotech corn in China is in place, which could be as early as 2013. Brazil, second only to the US in total land area planted to biotech crops, has a science-based, effective and responsible fast-track approval system for biotech crops and will also benefit from a rich pipeline of new biotech crops coming from trans-nationals, public-private

partnerships and its own public sector research institution, EMBRAPA. Brazil has already approved, for the first time, a 'stacked' biotech soybean tolerant to herbicides and resistant to insect pests. Initial commercialisation could begin as early as the end of 2012 when planting gets underway in the southern hemisphere. China already has seven million small farmers growing biotech cotton successfully and recently assigned priority for maize so that China can benefit from enhanced biotech maize that will increase meat productivity and make the country more self-sufficient for animal feed. As China is becoming more prosperous, more meat is being consumed which in turn creates more demand for the feed crops, maize and soybean. After more than a decade in development, approval of biotech 'Golden Rice,' is expected in the Philippines in 2013/14. This very important product has the capability to generate life-saving humanitarian benefits - 6,000 people a day, mainly women and children, die from complications resulting from vitamin A deficiency.

Finally Dr James noted that on the continent of Africa, South Africa has successfully planted biotech maize, soybean and cotton for over a decade, and Burkina Faso is cultivating *Bt* cotton, and Egypt *Bt* maize. Several African countries, including Uganda, Kenya, and Nigeria have field trials underway for a range of biotech crops with the widely adopted and accepted biotech cotton likely to be the first product to be commercialised. Biotech crop field trials in Africa include cotton, maize, banana, cowpea, cassava and sweet potato.

CROP PRICES LOOK FIRM FOR 2013

Yields of combinable crops in 2012 are reported to be below average in most of the major agricultural regions, particularly in the US where the extreme drought is seriously hitting the corn and soya bean crop. At this time of year companies whose business is heavily dependent on commodity prices, global farm incomes and projected crop plantings are planning budgets for next year. The largest agricultural equipment company, Deere & Co published its Agricultural Outlook report on 15 August. This provides valuable indicators for 2013 and beyond.

Weather extremes in 2012

The impact of drought on crop productivity in both the northern and southern hemispheres was reviewed earlier this year (*March Crop Scene*). Since then the situation in the US has got much worse. The USDA-ERS's report published on 31 August stated: "What had started out as a promising year for US crop production, with high total acreage planted and favourable early-season planting conditions, is turning into one of the most serious adverse weather situations in years. Crop production estimates in August provided by USDA's National Agricultural Statistics Service (NASS) are down 27% for corn compared to the Department's forecasts in May, down 16% for soya beans, and down 26% for sorghum. These estimates reflect sizeable reductions in crop yields per harvested acre as well as smaller-than-normal harvested shares of planted cropland."

It has however been noted that without modern corn hybrids, which are better able to withstand drought, the situation would have been much worse. Drought conditions are also seriously affecting yield prospects in the Black Sea regions of Russia and Ukraine, as well as in Kazakhstan, where total wheat production is predicted to be as low as half of that for 2011. In India rainfall is already down by 19% and monsoon rains are expected to be well below the long term average.

In Europe the situation is not as desperate but far from good. The USDA forecasts released in mid-August put corn production in the EU for 2012/13 (July to June reporting period) at 61.5 million tonnes, down 3.9 million or 6% from last year. This is due to the extremely hot and dry summer in the southern corn growing areas. Romania, Italy, and Hungary account for about two-thirds of the drop in estimated production. An exception to the drought conditions has been in northern Europe. Following the exceptionally dry conditions in 2011 through the spring of 2012 (*March Crop Scene*), the region from the Atlantic to Poland has suffered well above average rainfall. In the UK the summer of 2012 is reported to have been the wettest for 100 years. However this appears to have come too late to improve crop yields with low summer temperatures and excessive rain contributing to poor wheat yields and quality. With delayed harvests still underway early reports of wheat yields harvested in the UK are put at 7.1-7.5 tonnes/hectare combined with the five year average of 7.8 tonnes/hectare. Quality is also poor.

More positive indicators are coming in from Canada. Based on a survey of 15,000 farmers, Statistics Canada expects 2012/13 Canadian wheat production to reach 27 million tonnes, up 6.9% from 2011/12. China's corn production in 2012/13 also looks as though it will exceed earlier expectations. Forecasts at a record 200 million tonnes are up 3.7% from last year's record crop. This is coming about through both increases in yield and the extended area.

Prospects for 2013

Globally expectations as recent as June suggested good harvests and replenished global stocks leading to softer commodity prices. Now it is clear that the agricultural sector will be hard pressed to catch up with demand and restore stocks to more comfortable global levels.

Despite the problems Deere & Co sees the overall performance for the agricultural sector as a whole remaining strong for 2012 with price levels in 2013 indicating a very positive year for agriculture and for farmers. The indications are that in for 2012/2013 consumption of grains globally will exceed production, with the inevitable continued impact on prices. Furthermore with the consumption to stock ratios as they are there will be a very limited cushion should another crop failure occur.

The Deere report reviewed the main agricultural industry prospects regionally. It says the latest forecasts in the US for 2012 compared with those achieved in 2011 demonstrate dramatic change. In 2011 the average corn yield was 147 bushels/acre (9.2 tonnes/ha) and until early summer was expected to be about the same in 2012. By August the forecast had dropped to 123.4 bushels/acre. At the same time the price had risen to \$8.25/bushel from \$6.05/bushel in 2011. Soybean yields in 2011 averaged 41.5 bushels/acre (2.8 tonnes/ha). By August this year the projection for 2012 was 36.1

bushels/acre and the price had increased from \$12.25 to \$16/bushel. Projected wheat yields in the US are looking to have improved from 43.7 bushels/acre (2.9 tonnes/ha) to 46.5 bushels/acre. While wheat prices had shadowed the increase in the corn price, \$8.25/bushel up from \$7.25/bushel.

However when it comes to farm income in the US the trend remains upwards. Total farm income from crops was \$201 billion in 2011. For 2012 it is now forecast to be \$215 billion and for 2013, USDA is projecting \$227 billion.

One region likely to benefit in the immediate term will be Brazil and Argentina where extra plantings are expected this autumn in order to capitalise on the high prices for corn and soya beans.

In the EU farmer sentiment is described as positive based on the firm grain prices (and strong prices for pork and beef). Crop production levels are expected to increase in the north but could be limited in the south due to the economic situation and the probability of droughts. Farming prospects remain strong in Eastern Europe although financing remains an issue and could limit crop developments in countries such as Ukraine.

In China subsidies are reported to be slow getting to the farmer. Some increase in corn production can be anticipated, but soya bean plantings are expected to go down as farmers switch to rice and corn which offer better income potential. The prospects are good in Canada where prices remain high and weather has been favourable.

In summary the combination of high commodity prices and increases in crop plantings, in those regions where it will be possible, sets an encouraging market environment for agricultural input companies in 2013. Livestock farmers, others along the food chain and the consumer will be less pleased.

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