

crop protection monthly

international news, comments, features and conference reports

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LEAD ARTICLE

GM CROPS - WHAT ROLE FOR EU MEMBER STATES?

The European Commission's plans to allow member states freedom over planting GM crops came under more pressure last month. This follows earlier concerns raised by the European Parliament's Agriculture Committee (*January CPM*). A major surprise, although not specific to the draft proposal, came from a European Court of Justice ruling on 22 March, relating to France's decision taken in 2008 to ban Monsanto's MON 810 maize.

Advocate General Paolo Mengozzi, Europe's top court adviser, ruled that France could not block MON 810. He argued that as the strain was first authorised in 1998, it was illegal for France to implement the ban by invoking a safeguard clause not inserted into existing EU law until 2004. The safeguard clause that France applied states that where 'new or additional information' emerging after the original consent shows that a product 'constitutes a risk to human health or the environment,' an EU member state 'may provisionally restrict or prohibit' that genetically modified organism. However, Mr Mengozzi said: "The French authorities could not suspend the cultivation of the GM maize MON 810 on national territory without having first asked the European Commission to adopt emergency measures citing a risk to health and the environment." The court said that the decision by France should have been based on separate legal provisions covering raw material foodstuffs and genetically modified animal feed. Only Europe wide action could act sufficiently to protect health and the environment, consequently it should have been down to the Commission to decide.

Although national judges are not bound by the Advocate General's ruling in practice, his ruling usually stands. Consequently this brings into question the validity of the new proposals from the Commission. The EU health commissioner John Dalli, is reported to be awaiting a definitive judgment before commenting. A number of member states have also raised concerns about the Commission's proposal, in particular on what basis it is acceptable for individual countries to opt for the banning of GM crops. Six member states other than France - Austria, Bulgaria, Germany, Greece, Hungary and Luxembourg - have also banned GM maize cultivation.

While the draft report called for farmers to have a say on whether to use GM technology, MEPs said countries should be allowed to prohibit GMs to maintain public order. However, Caroline Spelman, the UK's Secretary of State for the Department of Environment, Food, and Rural Affairs stated that using public order as an opt-out reason would set a dangerous precedent by encouraging violence or militant damage to crops from anti-GM campaigners. This argument was supported by France's environment minister Nathalie Kosciusko-Morizet. Germany's environment minister Norbert Roettgen also raised doubts, claiming the opt-outs proved the proposals were not compatible with EU or World Trade Organisation rules, while delegates from Belgium and Austria also expressed concerns.

EU health commissioner John Dalli explained that work was already underway between the legal services of the Council and the Parliament to define more clearly the legal basis for the proposal. It is because of concerns that the EU is not operating within World Trade Organisation rules that the commission has proposed the compromise, allowing individual territories to cite cultural and other non-scientific reasons to ban growing, provided they allow EU-wide movement of permitted materials.

The Commission broadly wants restrictions by national authorities on GM crop cultivation removed because they flout World Trade Organisation rules but it does face a legal maze of opposition within the EU largely due to greater consumer concerns than in the US.

In the meantime crops containing tiny traces of genetically modified produce will be allowed to enter the European food chain for the first time under plans approved by EU governments. A European Commission proposal to end import restrictions on animal feedstuffs containing traces of GM crops, up to 0.1% was approved. France did obtain a change which will mean only GM crops that have already been given the go-ahead by EU food safety experts would be allowed to enter the food chain in this way.

EUROPEAN NEWS AND MARKETS

ARYSTA LIFESCIENCE ACQUIRES RUSSIAN DISTRIBUTOR

Arysta LifeScience has acquired a majority shareholding in the FES Group, a distributor of agrochemicals in Russia. The transaction received approval from the Russian Federation Federal Antimonopoly Service in January of this year. "The acquisition will bring additional solutions to our customers in Russia," said Kevin Smith, president of Arysta LifeScience and business unit head of Europe. "Together, we have the opportunity to service the market with an expanded product portfolio, a larger geographic footprint, enhanced technical capabilities and stronger supplier relationships." The FES Group was founded in 1996 and since then has established a leading position in the Russian agrochemical market, particularly in Central & South Russia. FES is headquartered in Stavropol, 1500 km south of Moscow.

BASF AND EVOLVA TO CONDUCT JOINT RESEARCH

BASF and Evolva Holding SA (www.evolva.com), a synthetic biology company based in Reinach, Switzerland, have signed a joint research agreement for the design of novel and optimised biosynthesis routes for selected natural products with crop protection potential. BASF will pay Evolva an up-front technology access fee and ongoing research fees. BASF will take forward any compounds produced during the collaboration and will pay Evolva research and development milestone fees as well as royalties. Neil Goldsmith, CEO and managing director of Evolva, said: "This is the first collaboration where our technology will be applied to the agricultural sector. It helps us to achieve our goal of improving food quality and helping advance the health and nutrition of individuals."

BAYER AND KEYGENE COLLABORATE TO CREATE NOVEL TRAITS

Bayer CropScience and KeyGene, a biotech-company headquartered in Wageningen, the Netherlands, have entered into an exclusive trait development agreement. Both companies will combine their expertise in the fields of protoplast technology and targeted molecular mutagenesis to create novel traits for crop improvement. The collaboration will initially focus on the use of KeyGene's new and proprietary *KeyBase* methodology to develop innovative traits for new oilseed rape varieties. *KeyBase* is expected to add value to Bayer CropScience's oilseed rape portfolio by generating changes in key genes. In addition, Bayer CropScience has the option to expand the agreement to include cotton and rice.

TEMPORARY REPRIEVE FOR ASULAM

On 10 March the EU Standing Committee on the Food Chain and Animal Health (SCoFCAH) was due to vote on a proposal to ban the use of asulam in the EU. Asulam is marketed by United Phosphorus Ltd (UPL) as *Asulox* and is an important herbicide in upland areas for the control of bracken (*Pteridium aquilinum*). In the event a blocking vote by six member states, UK, Spain, France, Slovakia, Czech Republic and Ireland, forced the Standing Committee to withdraw the proposal.

The proposal to ban asulam use, by September 2012, came about following an EFSA European peer review of data submitted in 2009 by UPL who were in the process of applying to reinstate asulam to Annex I, following its voluntary withdrawal in 2008. The review expressed concerns regarding inadequate data on consumer risk assessment relating to the use of asulam on spinach and due to the potentially toxic metabolite sufamilamide and its conjugated residues. Of wider impact are the long-term risk to birds and the risk to non-target terrestrial plants which were identified as critical areas of concerns.

The decision to delay the decision followed an active campaign by organisations involved in hill land management. The campaign was particularly vociferous in Scotland. A strong argument put forward is the absence of alternative control measures and the carcinogenic nature of bracken. George Lyon, Scottish MEP, was reported as saying: "This is an important step forward in securing the continued use of *Asulox* which is vital for our upland areas in Scotland. The stay of execution has forced the Commission to reassess the impact that a ban on *Asulox* would have on hill farmers across Europe". It is reported that the proposal will now be discussed at a committee in May. SCoFCAH have given no assurance that the proposed ban will be reversed in the long term.

EU VOTES IN FAVOUR OF DAZOMET

The European Commission's Standing Committee on the Food Chain and Animal Health (SCoFAH) voted in favour of the inclusion of dazomet (*Basamid*) in Annex I of Directive 91/414/EEC. This makes dazomet the first authorised soil fumigant under Annex I. The product has for the past 30 years been a key soil fumigant for a number of speciality crops globally. It has activity on a wide range of soil-borne pests and diseases and effectively reduces the level of plant pathogens and weeds prior to crop planting.

Basamid is a product of Kanesho Soil Treatment (KST), a joint venture between Agro-Kanesho and Mitsui & Co. Mitsui AgriScience's subsidiary, Certis Europe, markets the product as part of the *CleanStart* range of products. According to KST dazomet fits with Integrated Pest Management (IPM) principles and the objectives of the Sustainable Use of Pesticides Directive (2009/128/EC) by reducing the need for other crop protection treatments. Dazomet was one of 84 existing active substances considered in List 3B of the EU review programme. It was voluntarily withdrawn by KST in 2008 and then resubmitted in 2009. The Directive covering its inclusion in Annex I will enter into force on 1 June 2011.

BAYER TO SELL UK PRODUCTION SITE

Bayer CropScience is intending to sell its manufacturing plant located in Norwich, UK as a going concern. The 114 acre site employs 280 people and produces and formulates crop protection chemicals for sale worldwide, as well as specialist industrial chemicals. Site manager Tim Green said: "The decision to seek a buyer for the site is part of the on-going global consolidation of the manufacturing of agrochemical products by Bayer CropScience. This strategy announced by the Bayer Group in November 2010 will finance the expansion of growth areas by redirecting resources, improving efficiencies and reducing costs." The company is consulting with employee representatives and expects to complete this divestment by the end of the March 2012.

LOSS OF TRIAZOLES WOULD IMPACT ON EU GRAIN YIELD

Recent developments in the EU's plant protection policy could lead to a significant reduction in the options available for tackling fungal diseases in field crops. The triazole fungicides could be affected and would only be partially replaced by other active ingredients. A recent socio-economic study carried out by Institut für Agribusiness, Giessen, Germany (www.agribusiness.de) has examined the consequences. The study focused on grain production and measured the impact on gross margins and farm net income. It also conducted expert interviews with farmers and technical advisors in the main winter wheat production areas in the UK, France and Germany which provided data on expected yield losses. The study concluded that proper resistance management would become almost impossible. Disease options would also be limited due to the inability of alternatives to eradicate diseases such as Septoria and Fusarium. The study estimated that grain yields would decrease significantly at around 17% in Germany, 10-15% in the UK and 20% in France.

TRAINING AND CERTIFICATION IN THE EU

The relatively soft wording in the forthcoming EU Sustainable Use Directive could mean that standards of agrochemical use and training of operators will decline in the UK, according to the UK's Crop Protection Association (CPA) and Agricultural Industries Confederation (AIC). The particular concerns relate to operator training and certification. In the wording under the Sustainable Use Directive, member states would be required to provide access to training, rather than stating that all sprayer operators and advisers must be trained and certificated by law. The UK Government plans to transpose the text of the Directive directly into UK law.

CPA and AIC are urging the Government to ensure that the UK legislation reflects the intent of the Directive to reinforce controls on the use and distribution of pesticides, rather than to weaken them. In the UK there is already in place a statutory requirement for certification of all sprayer operators. The industry wishes to see an extension of this requirement to all advisers, as well as the introduction of new statutory provisions for on-going training and professional development. AIC chief executive David Caffall commented: "If transposed directly, the Sustainable Use Directive has the potential to sweep away current professional standards on user and adviser certification and training. The industry remains committed to promoting best practice in the distribution and use of pesticides and this must be underpinned by legislation to protect and enforce minimum standards." CPA chief executive Dominic Dyer added: "Normally we would support Government moves to avoid gold-plating of EU legislation, but in this case it could result in a dilution of the existing robust UK controls on pesticide use."

AMERICAN NEWS AND MARKETS

AGRAQUEST RAISES NEW FUNDING

AgraQuest, the US-based biopesticide business, has raised \$17.7 million in a financing round that will further its efforts to develop and market innovative products. London-based Generation Investment Management LLP acted as co-lead investor in the round which also included a significant investment from an existing AgraQuest shareholder, Otter Capital. Proceeds from the financing will be used to advance AgraQuest's biopesticide research and development programme as well as to expand technology licensing and acquisition efforts. The company is developing products to control insect pests and diseases, while minimising the impact on the environment. It says that its pipeline of new natural active ingredients features human and environmental safety profiles that are superior to traditional pesticides. "We are very pleased to complete this round of financing with both existing and new investors," said Marcus Meadows-Smith, CEO of AgraQuest. "It shows that our current investors are excited about our product portfolio, both current and pipeline, and that our long term strategy has been validated by new investors such as Generation Investment Management."

Agraquest have also announced that Bob Shapiro, a former chairman and CEO of Monsanto, has joined its board of directors. He will help guide AgraQuest's anticipated rapid growth in the global agricultural inputs market. "Bob is a tremendous addition to our board with his deep understanding of agriculture and his vision and experience in transforming Monsanto, and thereby the agriculture industry," said Mr Meadows-Smith.

SYNGENTA LICENSES BIOPESTICIDE FROM MARRONE BIO INNOVATIONS

Syngenta has signed a distribution agreement with Marrone Bio Innovations, a US developer of biopesticides, giving the company exclusive distribution rights in the Europe, Africa, Middle East region for Marrone's bio-fungicide, *Regalia*. The fungicide is based on an optimised plant extract from giant knotweeds. It controls powdery mildews, downy mildews, botrytis and bacterial diseases in speciality crops. "The partnership with Marrone demonstrates how we can expand the options we offer to growers", said John Atkin, Syngenta COO. "This innovative bio-fungicide will complement our integrated crop management programme, and our grower network makes us an attractive distribution partner." Syngenta will market the bio-fungicide under its own trademarks and will include it in its European crop programmes. *Regalia* can be used in alternation with the company's synthetic fungicides for mildew control, or mixed with other fungicides to enhance their activity. The product leaves no residues in the harvested produce.

EPA GRANTS APPROVAL FOR SYNGENTA'S CEREAL HERBICIDE

Syngenta's herbicide Sierra (flucarbazone) has been granted Federal Environmental Protection Agency (EPA) registration. Sierra controls a broad spectrum of grass and broadleaf weeds in winter wheat, spring wheat and durum. "This new ALS-inhibitor herbicide will help growers manage weed control in wheat and will offer a new resistance-management tool for control of ACCase-resistant wild oat and green foxtail," said John Foresman, herbicide brand manager, Syngenta. Sierra enables growers to customise grass and broadleaf weed-control solutions on a field-by-field basis and provides the tank-mix flexibility needed for one-pass weed control. "Flucarbazone-sodium, the active ingredient in Sierra, offers excellent control of some of the most difficult to control grass and broadleaf weeds in wheat."

CHEMTURA INTRODUCES NEW SOYBEAN SEED TREATMENT

Chemtura AgroSolutions, has introduced two *Rancona* seed treatments formulated for soybeans. They contain the active ingredient ipconazole and provide growers with the opportunity to maximise emergence and uniformity leading to greater soybean yield potential. One is a concentrated, commercial formulation *Rancona 3.8FS* and the other a ready-to-use formulation *Rancona Summit*. The ready-to-use product has a unique micro-dispersion formulation that provides good seed coverage and adhesion, reducing dust and improving plantability. "Seed treated with *Rancona* will be better protected against seed-borne Sclerotinia and Phomopsis than seed treated with other products," claims Kevin Hamilton, seed enhancement commercial manager, Chemtura AgroSolutions. "The systemic properties of the products have also been proven to control soil-borne diseases, including Rhizoctonia."

UNITED PHOSPHORUS ACQUIRES Foothold IN BRAZIL

United Phosphorus (UPL) has acquired a 50% stake in Sipcam Isagro Brasil (SIB) from Isagro. This gives the Indian agrochemical manufacturer a foothold in Brazil, which ranks among the top five largest crop protection markets in the world. It also gives UPL a position in the formulations business. Sipcam Isagro Brasil was a 50:50 joint venture between the two Italian groups Sipcam-Oxon and Isagro. Sipcam will continue to hold the other 50%.

AGROCHEMICAL SALES TO GROW IN BRAZIL

Agrochemical sales in Brazil, the second largest market after the US, reached \$7.3 billion in 2010. According to the National Association of Plant Protection (Andef) this could increase by 15% in 2011 although the Ministry of Agriculture forecasts a more modest increase of 4.4%. The main drivers are likely to be strong prices for soybeans, corn, cotton and sugar that will encourage further expansion. Some 80% of all agrochemicals used in Brazil are applied to the four major row crops – 46% on soybeans, 11% on sugar cane, 10% on corn and 10% on cotton. The remainder is used on tree and fruit crops, horticultural crops and forestry. Greatest usage was in the Matto Grosso state (20%) followed by Parana (15%), Sao Paulo (14%), Rio Grande do Sul (11%), Goias (10%) and Minas Gerais (9%).

NUFARM TO MARKET VALENT HERBICIDE

Nufarm Agriculture is to market Valent's herbicide *Valtera* (flumioxazin) in Canada. The product is a pre-emergence residual herbicide launched in 2009 that offers soybean growers broad spectrum weed control. It plays an important role in total weed management programmes by contributing effective control of broadleaf weeds such as Eastern black nightshade, lamb's-quarters and pigweeds—both Group 2 and triazine-resistant biotypes. "Adding *Valtera* to our portfolio will create new opportunities for us in this important Canadian market," said Yvonnick Jambon, general manager for Nufarm in Canada. "*Valtera* has quickly become the standard for Eastern black nightshade control in soybeans."

BAYER CANCELS PRODUCTION OF TEMIK

Following an agreement reached last year with the US Environmental Protection Agency (EPA), Bayer CropScience was to phase-out its nematicide *Temik* (aldicarb). The company had timed production to end in 2012, to allow for an orderly market exit and to meet immediate customer needs. However, due to delays no product would have been available for the 2011 growing season. Bayer has, therefore, decided to start decommissioning the production units in Institute, West Virginia and will close the formulation facility in Woodbine. "This was a very difficult decision, particularly as our employees had done everything possible to ensure the operational safety of the newly-constructed MIC unit during the remaining production period", said Achim Noack, member of the board of management of Bayer CropScience. "Our business case was based on our ability to supply the market needs beginning in 2011, and with the recent delays, that plan is no longer economically viable."

BAYER PURCHASES US SEED COMPANY

Bayer CropScience is to purchase Hornbeck Seed Company Inc. (www.hbkseed.com), a privately-held company headquartered in DeWitt, Arkansas, US. Hornbeck supplies soybean, rice, and wheat varieties in the Mid-South. The company has an in-house soybean breeding programme and proprietary soybean germplasm. Bayer CropScience will acquire the seed businesses and gain access to the germplasm for future variety and trait development.

Bayer sees the acquisition as a logical step in its meeting the needs of southern farmers, particularly those growing soybeans. Previous milestones were the Stoneville Pedigreed Seed acquisition in 2007, the MS Technologies collaboration in soybeans in 2007, the launch of *LibertyLink* soybeans in 2009 and the Athenix Corp acquisition in 2009. The company believes that Hornbeck's focus on breeding top yielding soybean varieties, combined with Bayer CropScience's active trait research and development pipeline, including herbicide-tolerance and insect and nematode resistance programmes specific to soybean, will strengthen Bayer CropScience's position as a provider of value-added seeds and traits. The acquisition will bring to the company experience in the areas of soybean breeding and licensing, as well as in soybean, rice and wheat seed production, seed processing and agronomic services.

Sandra E Peterson, chairman of the board of management at Bayer CropScience, said: We already have a very successful cotton, canola and vegetable seed business in the US, and we have initiated research to improve wheat breeding as well. We will now further complement these activities by adding seeds for

soybeans. Soybean is a strategically important crop for Bayer CropScience and this acquisition is an important first step towards realising a fully integrated soybean business. It will allow us to serve soybean farmers with complete solutions of seed, seed treatment, traits and crop protection solutions." The area planted with soybean in the US in 2010 was 31.3 million hectares (77.4 million acres). This represented around 35% of global production.

EPA APPROVES AGRISURE VIPTERA TRAIT

The US Environmental Protection Agency (EPA) has granted approval for the *Agrisure Viptera 3220* trait stack, which offers corn growers dual modes of action against above-ground insect pests. "With this approval, Syngenta can offer growers more control of insects with a reduced 5% structured refuge," said David Morgan, Syngenta's regional director for North America and president of Syngenta Seeds, Inc. "Not only do growers enjoy greater productivity through reduced refuge, they also will get more yield benefits from the *Agrisure Viptera* trait and its superior control of the pest complex."

In 2010 Syngenta trials, triple stack hybrids with the *Agrisure Viptera* trait outyielded competitive triple stack hybrids by more than nine bushels/acre (0.6 tonnes/ha) on average. In addition, the *Agrisure Viptera 3220* trait stack contains the *Agrisure CB/LL* trait, which has been used to protect corn from European corn borer for more than 10 years while offering at the same time glufosinate tolerance, the *Herculex I* trait for corn borer protection and the *Agrisure GT* trait for glyphosate tolerance. The *Agrisure Viptera 3220* trait stack is designed for geographies where corn rootworm management is not a primary issue. Syngenta anticipates that hybrids with the trait stack will be available for planting in the 2012 growing season pending receipt of all remaining regulatory approvals for cultivation and import markets. Syngenta also has submitted a 5% blended refuge-in-a-bag version of the trait stack for EPA approval. It is anticipated that this product concept will be marketed under the name *Agrisure E-Z Refuge*.

BRAZIL APPROVES NEW INSECT CONTROL TECHNOLOGY

New corn insect control technology known as *Powercore* is the first five-gene trait stack to be approved by the Brazilian National Biosafety Technical Commission (CTNBio) for sale in Brazil. *Powercore* is the outcome of a cross-licensing agreement and research and development collaboration between Monsanto and Dow AgroSciences. The new trait stack controls major Brazilian corn insect pests - *Spodoptera frugiperda*, *Helicoverpa zea*, *Diatraea saccharalis*, *Agrotis ipsilon*, and the soil pest *Elasmopalpus lignosellus*. It also offers tolerance to glyphosate and glufosinate herbicides. *Powercore* is to be offered by Dow who will incorporate it in its high yield corn hybrids. It is expected to be available to Brazilian corn growers sometime in 2012.

ADVANTA AND CHROMATIN COLLABORATE ON SORGHUM

Advanta US, a subsidiary of the international seed company Advanta, and Chromatin (www.chromatininc.com), the Chicago-based biotechnology company, have entered into a commercial agreement for the development of sorghum. Under the agreement, Chromatin will have a non-exclusive, royalty-bearing license to access sorghum germplasm from Advanta. Sorghum is a high-yield, drought-resistant crop. Flexibility in terms of potential growing conditions makes it possible to expand sorghum production on to marginal land. The crop has the potential to be used in a range of bioprocesses, including transportation fuels, biochemicals, renewable materials and clean biomass energy. Daphne Preuss, Chromatin's CEO, said: "Having the ability to access and conduct research on quality sorghum germplasm, such as that from Advanta, is an important step in our path to advance sorghum's unique ability to provide a sustainable source of sugar, starch and lignocellulose."

REPORT CALLS FOR MORE US ACRES

The Rabobank Food & Agribusiness Research and Advisory (FAR) group (www.rabobank.com/far) has concluded that in order to build US and global supplies to acceptable levels, more corn, cotton, soybeans and wheat will need to be planted this year in the US than ever before. It is projected that 237 million acres of the four major US crops will be required in 2011. The findings are based on the Rabobank FAR team's global agribusiness marketplace report, *The Battle for Acres: US Field Crops in Competition*.

The 237 million acres estimate represents an increase of seven million over total planted acres in 2010, and an increase of three million over 2008's record high of 234 million acres. While profit margins favour corn over soybeans and wheat, the report also noted the differential is not strong enough to cause

significant substitution among the four major crops. This implies a need to expand planting by at least two to three million acres onto land not currently producing one of the four major crops.

Radobank says that US producers should expect high price volatility to continue through the planting season. Markets will continue to be volatile as they try to sort out how much of each crop should be planted in the US this year says the report. It goes on to say that the consequence of the current competition among major crops, other principal crops and land uses is an intensely volatile environment which could drive prices to historical highs.

OTHER NEWS AND MARKETS

MONSANTO AND BASF SIGN NEW DICAMBA AGREEMENT

BASF and Monsanto Company have announced a new agreement to collaborate on the advancement of dicamba tolerant cropping systems. Under the agreement the companies have reciprocated on licenses and BASF has agreed to supply formulated dicamba herbicide products to Monsanto. BASF has developed innovative dicamba formulations and Monsanto has proprietary rights to a dicamba tolerant trait for soybeans. The new dicamba tolerant system is expected to be introduced in the US and Canada in the middle of the decade. With soybeans the trait will be stacked with the high yielding *Genuity Roundup Ready 2 Yield* soybean trait. Monsanto is reported to have dicamba tolerant corn, cotton and canola crops in its research and development pipeline.

Markus Heldt, president of BASF's Crop Protection division, explained how improvements in dicamba products was continuing: "Our next generation products will offer yet another step change in volatility reduction while maintaining the highest level of weed control. The system, along with proper stewardship measures, will ultimately deliver peace of mind for growers." He also referred to how dicamba tolerant crops will help to overcome glyphosate weed resistance problems: "The introduction of dicamba tolerant crops combined with improved dicamba formulations will provide farmers the tools they need to combat the yield-robbing weed resistance some are facing in their fields today." Monsanto executive vice president of sustainability, Jerry Steiner, said at a Reuters press conference that dicamba offers a valuable tool in the face of increasing glyphosate resistance. He added: "We have relied on glyphosate itself for too long. We need two modes of action on every acre. The dicamba will provide another great opportunity for a second mode of action that will pick up on broadleaf weeds."

BAYER AND SYNGENTA TO CO-DEVELOP HERBICIDE TOLERANCE TRAIT

An alternative mode of action for herbicide tolerance is being co-developed by Bayer CropScience and Syngenta. The two companies have entered a development agreement on an HPPD herbicide tolerance trait for soybeans. The trait is in early development with launch in North America expected in the second half of this decade. By incorporating tolerance to HPPD herbicides, and thereby enabling the use of leading weed control products, the new trait will provide a powerful mode of action for weed control and the management of weed resistance, particularly to glyphosate.

The trait will have significant potential for out-licensing as well as in the companies' respective branded seeds businesses. "Through this collaboration we will be able to further complement our HPPD herbicide portfolio and our trait pipeline for soybeans with yet another solution for improved grower productivity and sustainability," said Lykele van der Broek, chief operating officer for Bayer CropScience. "HPPD technology will complement the *LibertyLink* trait and will provide powerful alternatives to other herbicide tolerance products in development," said Davor Pisk, Syngenta COO. "The HPPD trait will broaden the trait options available to growers and expand the market opportunity for our leading herbicide *Callisto* (mesotrione)," he added.

BIOLEAP AND SYNGENTA TO COLLABORATE

BioLeap, Inc. has entered into a research collaboration with Syngenta to apply its molecular-design technology to the discovery of Syngenta crop protection products. The agreement builds upon and expands previous research carried out for Syngenta. Under the agreement, Syngenta Ventures will make an equity investment in BioLeap. David Pompliano, chief executive officer of BioLeap, said: "One of our objectives is to further our alliances with companies in the agriculture and consumer products industries while we maintain our focus on pharmaceuticals. The collaboration with Syngenta will take advantage of the proprietary advances that BioLeap chemists have made in creating and using computer simulations both to design compounds de novo, chemical fragment by chemical fragment, and to tailor existing designs. He added: "Every BioLeap design builds on calculations of the binding energies between the compound being fashioned in silico and its biological target. BioLeap's work on these targets will be exclusive to Syngenta."

ARYSTA LIFESCIENCE ENTERS THE INDIAN MARKET

Arysta Lifescience has acquired a majority interest in the Mumbai-based company Devidayal Sales Limited (DSL). DSL is an agrochemical and micronutrient formulator operating through 26 branch offices across India. In addition to supplying more than 20,000 retail outlets it also exports to 35 countries worldwide. Wayne Hewett, president and CEO, Arysta LifeScience Corporation, said: "Arysta continues to grow its business by focusing its investment and strategic initiatives in high-growth, emerging markets. By combining our portfolio of global products and technologies with DSL's manufacturing and distribution network for the Indian market, we are well positioned to serve customers in India as well as other international markets.

Arysta LifeScience plans to capitalise on DSL's skills to accelerate the registration and introduction of proprietary products and technology to the Indian market. The company believes it can also utilise DSL's formulation and packing capabilities to better serve its customers outside India. Arysta, which was formed in 2001, has grown into a \$1.3 billion turnover business based on the sale of development and generic products in 125 countries. Products include agrochemicals, micronutrients, animal and human health treatments. In 2008, Arysta LifeScience was acquired by Industrial Equity Investments Limited (IEIL), owned by The Permira Funds, a leading international private equity firm.

BAYER TO DISTRIBUTE CHEMTURA'S SEED TREATMENTS IN CHINA

Chemtura Corporation has announced that Bayer CropScience will be the exclusive distributor of the company's seed treatment products in China. Bayer will incorporate the products into its own seed treatment product range. Chemtura says that with the predicted rapid growth of seed treatments in China, the agreement is an opportunity for both parties to combine their product portfolios to create an attractive critical mass. In addition to being granted the right to import, sell, and commercialise the Chemtura seed treatment range, Bayer will have exclusive access and use of the products' registrations and trademarks in China. Both parties will also be seeking further opportunities to broaden the scope of the agreement by including product formulation and new product development.

AUSTRALIAN SURVEY TO EXAMINE DISEASE RESISTANCE IN BARLEY

A Grains Research and Development Corporation (GRDC) funded survey will be examining hundreds of samples of powdery mildew on barley in Australia. Professor Richard Oliver, Australian Research Centre for Necrotrophic Fungal Pathogens, said the samples would reveal fungicide resistance patterns, and help breeders produce new barley varieties resistant to powdery mildew. The survey follows confirmation in 2010 of triazole resistance, Australia's first case of a crop pathogen resistant to a fungicide. Professor Oliver said the survey would help fine-tune advice to growers about which fungicides were still effective. "The survey will also provide information about different virulence genes expressed by the pathogen," he said. "This will guide plant breeders' selection of resistance genes which could result in new barley varieties with improved resistance within the next two to five years." Powdery mildew causes annual losses of about \$39 million to Australia's barley crops, with most losses incurred in Western Australia.

FUNDING ESTABLISHED TO RESEARCH WHEAT STEM RUST

Several countries are set to benefit from a \$40 million research initiative. The UK's Department of International Development (Dfid) and the Bill and Melinda Gates Foundation have said they will finance a project led by Cornell University that aims to find ways of combating Ug99, an evolving race of wheat stem rust. The five year grant, made to the Durable Rust Resistance in Wheat (DRRW) project at Cornell, will support efforts to identify new stem rust resistant genes in wheat, improve surveillance, and multiply as well as distribute rust-resistant seeds to farmers. The Dfid will contribute \$15 million while the Bill and Melinda Gates Foundation will provide \$25 million towards the project (www.wheatrust.cornell.edu).

It is estimated that as much as 80% of all wheat varieties planted in Asia and Africa are susceptible to the wheat stem rust whose spores are mostly carried by wind over long distances and across continents. "Against the backdrop of rising food prices, and wheat in particular, researchers worldwide will be able to play an increasingly vital role in protecting wheat fields from dangerous new forms of stem rust, particularly in countries whose people can ill afford the economic impact of damage to this vital crop," said Professor Ronnie Coffman, head of plant breeding and genetics at Cornell University and director of DRRW.

The fungus was first discovered in 1998 in Uganda, the original Ug99 has also been found in Kenya, Ethiopia, Sudan, Yemen and Iran. "Wheat is one of Kenya's most important crops, second only to maize. Our people depend upon it for food security," said Ruth Wanyera, a plant pathologist with the Kenya Agricultural Research Institute in Njoro. "We hope this important investment on the part of the Gates Foundation and Dfid will prompt other funders and policy makers in the industrialised and developing worlds to support efforts to protect our global wheat supply."

SWISS BIOSTADT AND SYNGENTA JOIN FORCES IN NIGERIA

Swiss Biostadt and Syngenta are joining forces to boost farmers' productivity, improve incomes and guarantee food security in Nigeria. The two companies have recently conducted a survey of Nigeria's agro-ecological zones with a view to understanding the emerging challenges faced by farmers. Patrick Mirbey, Syngenta's head of North and West Africa, says: "It became clear to us during the visits to farmers' fields that pest and diseases are still a major challenge. Another is weeds and low on-farm productivity." Factors contributing to low productivity include inadequate availability of inputs such as pesticides, herbicides, fertilisers and poor extension services. In some cases where inputs are available misapplication due to poor knowledge impacts on yields and places the farmers in poverty.

Over the years, Swiss Biostadt and Syngenta have been providing crop improvement solutions through improved seeds, pesticides, and the training of farmers. "This strategy has yielded results but we are now reviewing how best farmers can access and adopt our new innovations and services," said Mr Mirbey. The survey also shows that post harvest losses have remained a big constraint with estimates ranging from 50% and above depending on the area and the crops. At a recent training meeting the companies reviewed bottlenecks in the agricultural value chain and mapped out plans for the future. As well as better use and application of pesticides and improved seeds, they are also looking at offering farmers seed varieties which produce crops with a much longer shelf life.

BAYER OPENS NEW SEED FACILITY IN SINGAPORE

Bayer CropScience has opened an expanded seed research laboratory in Singapore. The new facility represents an investment of around €20 million over the next five years and is dedicated to support the development of new high yielding and high quality seed varieties and hybrids. Bayer says the original rice seed analytics laboratory has been relocated and expanded to support a broader range of seed breeding and development activities across Asia/Pacific. The new research unit will work with cutting-edge technologies like DNA marker analysis and molecular assisted breeding. Scientists will screen and integrate innovative agronomic and quality traits in canola, corn, cotton, wheat, soybean and rice. Additionally, work will also focus on plant pathology for better control of diseases. Agronomic traits of interest include novel modes or enhanced resistance to diseases, pests and environmental stress. Quality traits of interest to include, for example, better storability, easier processing, improved grain quality and nutritional profile, better cooking features and enhanced fibre quality in the case of cotton.

Sandra E Peterson, CEO of Bayer CropScience, said: "This state-of-the-art facility which is centrally located in Singapore in an ideal hub location to respond quickly to the needs of our breeders and seed production technicians across Asia/Pacific. Singapore has an established research and development structure and is a source of skilled staff. The new facility will increase the breeding capacity for Bayer CropScience." Currently 15 scientists and technicians are working there but there is capacity for more than 30.

CONFERENCES AND FEATURES

FUNDING AGRI-INNOVATION

SCI's BioResources Group held a one day conference Funding agri-innovation: new ventures in food security and biorenewables in London on 22 March which brought together scientists, entrepreneurs, investors and business development specialists to discuss funding new ventures in agriculture. Dr Alan Baylis reports for Crop Protection Monthly.

Challenges, opportunities and issues

Ian Crute, UK Agriculture and Horticulture Development Board, opened the conference by discussing the need for innovation in global agriculture. The UK Government's recently published Foresight report on *The Future of Food and Farming (January CPM)* emphasised the trade-offs that will be needed to balance achieving food security, optimal use of land, and reducing the impact of farming on climate change. It is becoming accepted that the concept of sustainable intensification of agriculture is the way forward. Transfer of science into practice is imperative. Some recent research on optimising the use of nitrogen fertiliser and fungicides in wheat has demonstrated how appropriate use of high inputs can reduce carbon footprint per unit of production. New technologies must be assessed not only by the benefits and risks associated with their adoption, but also by the problems which will be incurred if they are not accepted. Not all important targets for innovation will be profitable, so this points to the importance of public and private sector partnerships to find the necessary funding for new ventures.

Adrian Higson, National Non-Food Crop Centre, York, UK focused on biorenewables and how the EC Lead Market Initiative for Bio-based Products sets out to encourage innovation. The initiative targets are bioplastics, biolubricants, biofibres for textiles, composite materials for construction and automotive sectors, chemical and pharmaceutical building blocks, organic acids, amino acids and enzymes. Activities and measures to be addressed under the initiative include finance through public and private funds and partnerships for research and proof of concept studies, access to demonstration facilities to bridge the gap between research and market readiness, fiscal incentives and grants for manufacturing, and stimulating the availability of feedstocks from crops or waste.

Simon Turner, Canopus Management, noted that the total annual investment by venture capitalists in the UK was estimated to be £11 billion (\$17.63 billion) in 2007, but this has since fallen by more than 70% and most goes into ICT projects. Biotechnologies providing broad platforms for potentially multiple applications are most attractive to private investors. Early stage funding is a particular issue and start-ups need to look to sources such as the Technology Strategy Board, Research Councils and European Commission, or collaborations with major players.

Calum Murray, Technology Strategy Board (TSB), discussed the ways and means by which his organisation supports the development of new agricultural technologies in the UK. The Sustainable Agriculture & Food Innovation Platform is focused on crop productivity, sustainable livestock production, waste reduction and management, and greenhouse gas mitigation. Within the crop productivity area the focus is on crop protection and nutrition. Last year saw the first call for projects seeking new approaches to crop protection. From an initial 100 expressions of interest, 58 applications were made under the call and 32 projects were funded. A call for funding opening in April 2011 will address the issue of the shortfall in vegetable protein production, Europe being only 30% self-sufficient.

What are investors looking for in attractive propositions?

David Buckeridge, Paine & Partners, represented the views of a US-based investment company specialising exclusively in the agri-food sector. Paine and Partners currently manages around \$2.7bn of private equity capital. Some notable acquisitions include Advanta in 2004, at the time the largest independent field crop seeds company, and Mexico-based Seminis, a fruit and vegetable seed company operating in 150 countries. These companies are now part of Limagrain and Monsanto, respectively. Mr Buckeridge said it was important to pitch to the right kind of investor, in terms of the size of investment needed and their particular interests. Entrepreneurs need to be clear about their product, its market and how they will extract value. Investors want to appreciate the risks. They like to see commitment and

consistency in the management team and attention paid to the skill-sets necessary to take projects forward.

John Cripps, Syngenta Ventures, said that his organisation has a \$100 million fund and typically invests \$1-5 million in early stage companies, followed by \$10-15 million over five to seven years. In 2009, Syngenta Ventures made a first investment of \$12 million in Metabolon, a US-based company specialising in biochemical profiling or metabolomics. Recently, Syngenta has been setting-up collaborations in new technologies for the Brazilian sugarcane market. *Plene* is an innovative system for growing sugarcane involving the mechanised planting of very short sections of cane coated with treatments to protect and enhance early growth. There has also been an investment in Chromatin Inc.'s novel gene stacking 'mini-chromosome' technology'. This allows the simultaneous and precise introduction of multiple genes into germplasm.

Case studies

Chris Richards, chairman of the board of directors of Arysta LifeScience, described how the company came to achieve a global revenue of \$1.4 billion in 2010, a doubling of sales since the company's formation in 2001. With a Tokyo headquarters, Arysta now has 55 regional offices serving 125 countries and sees itself positioned between the industry majors which offer product leadership and the global generics which go for price leadership, in a strategy he described as 'segment focused'. The company has acquired new products to serve niche and emerging markets such as the herbicides amicarbazone and flucarbazone-sodium. Amicarbazone (*Dinamic*) is a broad-spectrum pre-plant, pre-emergence and post-emergence herbicide for sugarcane and corn while flucarbazone-sodium (*Everest*) is applied post-emergence to cereals for mainly grass weed control. Although both come from triazolinone chemistry, amicarbazone is a photosystem II inhibitor and flucarbazone is an ALS inhibitor and both have roles in resistance management. Other leading products include captan-based fungicides, acephate insecticide and iodomethane (*Midas*), a soil fumigant for high value crops which is used to replace methyl bromide. In 2008, Arysta entered into a partnership with UK-based Plant Impact, initially covering *BugOil*, a patented natural plant insecticide. More recently, a 10 year distribution agreement for Plant Impact's *InCa* calcium delivery product has been signed to cover exclusive sales in Central America. The *InCa* product will be branded as *Talentstum*.

Hadyn Parry, Oxitec (www.oxitec.com), presented an overview of the company and its technology. Spun-out from Oxford University in 2002, the company has received funding from organisations such as the Wellcome Trust, Gates Foundation Grand Challenges and venture capitalists including Oxford Capital. Oxitec's core technology is known as RIDL (Release of Insects carrying a Dominant Lethal gene). This is used to breed insects with a genetic modification that causes their offspring to die. The first major target has been the mosquito (*Aedes aegypti*) which is the principle vector of dengue fever, now a problem in over 100 countries. WHO estimates that each year there are over 50 million cases and around 2.5 billion people are at risk. Vector control is the only practical solution. 'Sterile' *A. aegypti* males are released to compete with wild males for females. Ultimately, the pest population is suppressed or even eliminated. Other aspects of the technology include incorporating a fluorescent marker gene into the insect genome so that the distribution of released males can be tracked. Male insects do not bite humans or spread disease. Strains of agricultural pests modified by RIDL technology are in various stages of evaluation. They include the olive fly (*Bactrocera oleae*), Mexican and Mediterranean fruit flies (*Anastrepha ludens* and *Ceratitidis capitata*, respectively) and the serious cotton pest, pink bollworm (*Pectinophora gossypiella*).

Rupert Osborn, IP Pragmatics, discussed the progress of commercialisation of early stage agricultural biotechnology from academia with some examples. The Belgian company CropDesign has been acquired by BASF Plant Science. CropDesign has expertise in high throughput screening of traits targeting yield enhancement, abiotic stress reduction and nutrient use efficiency. Icon Genetics, a German company, was acquired by Bayer Innovation. Icon Genetics specialises in technologies for the production of pharmaceuticals and other high value protein products from plants. Plastid AS is a Norwegian company originating from the University of Stavanger, specialising in the transformation of chloroplasts. Transgenes are inserted into plastid DNA rather than nuclear DNA, so avoiding any issues of cross-pollination from GM plants. In the UK, Rothamsted Research is working with BASF on the novel oilseed crop *Camelina sativa* ('gold of pleasure') as a biodiesel feedstock and to successfully express genes for long chain omega 3 fatty acids to improve the nutritional content of the oil. Genes previously used with oilseed rape have been found to be expressed much better in Camelina.

John French, InCrops, explained how his organisation is a partnership of university research, public sector and corporate partners working with small and medium enterprises (SMEs) to develop the commercial potential of new crops and their products. Currently there is strong interest in initiatives in the 'green built environment'. For example, Hemp Technology is a company which manufactures a variety of biocomposite products such as building blocks and insulation boards based on fibre extracted from industrial hemp. In the biopharma area, InCrops are working with Ampika, a Cambridge University spin-out. Ampika work with indigenous people in Peru to identify and develop pharmaceuticals from traditional medicinal plants. A number of other projects span the bioenergy and biofuels sector.

BASF PIPELINE ACTIVES INCREASE IN VALUE

The value of the BASF Crop Protection pipeline has jumped to €2.4 billion, an increase of €200 million compared to 2010.

The company's fungicide *Xemium* (fluxapyroxad) contributed to this increase. With peak sales potential estimated in excess of €200 million, *Xemium* will be available in more than 100 crops from 2012 onwards. BASF says that farm demand for the company's herbicide *Kixor* (saflufenacil) is also exceeding expectations. In North America *Kixor* was the most successful herbicide launch in 10 years with a projected sales potential of more than €200 million. In addition BASF says it is on track to reach peak sales of €700 million with F 500 (pyraclostrobin), the basis of the company's *AgCelence* portfolio.

Markus Heldt, president of BASF's Crop Protection division, said: "Today we have one of the strongest pipelines in the industry. With our high investment in research and development we aim to sustain our role as a leading innovator." In the last eight years BASF has increased the share of sales from new active ingredients from 6% to 30%. In 2010 BASF reached approximately 70% of projected peak sales potential from the active ingredients launched since 2002. Investments in R&D increased to €393 million in 2010, representing about 10% of BASF Crop Protection sales.

Xemium is the company's next generation carboxamide. BASF says it has plenty of experience of this chemistry and will be launching a new carboxamide that can be used across all fungicide market segments including major field crops - cereals, corn and soybeans – and fruit and vegetables. The data submission process is underway and regulatory approval is expected in time for a 2012 market launch. There will be a gradual introduction in 50 countries. The company anticipates that the product, which will be used on more than 100 crops, will generate peak sales of €200 million. *Xemium* will also be used as a seed treatment.

Initium (ametoctradin) is BASF's other new fungicide. It has been developed for use on speciality crops which includes grapes, potatoes and vegetables. It is a highly selective and effective fungicide that gives protection against potato late blight and downy mildew in grapes and various vegetable crops. *Initium* will be launched in some European markets such as Germany, the UK and France in 2011.

BASF's herbicide *Kixor* was successfully launched in the North and Latin American markets in 2010. The product is effective against tough to control broadleaf weeds in a wide range of crops. With the spread of weed resistance the herbicide market is projected to reach €20 billion by 2020. The company believes that with *Kixor* it is in a position to take a good share of that growth. With approvals for use in 30 crops *Kixor* can be used to control an increasing number of weeds that have become resistant to glyphosate.

In addition to disease control, several BASF products containing *F500* proactively improve plant health. Treated crops show better stress tolerance, better growth performance and plant strength. Launched in 2007 *AgCelence* is BASF's global plant health umbrella brand, delivering healthier crops, which are easier to harvest, accompanied by significant higher yields of up to 10%. In 2011 BASF will continue to launch products from the *AgCelence* portfolio in Europe, Asia and South Africa. *F500* is used in numerous crops including corn, soybean, flowers, fruit, vegetables, sugarcane, sunflowers, bananas, grapes and cereals, and has peak sales potential of €700 million.

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