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LEAD ARTICLE

BAYER TO BUY AGRAQUEST

Bayer CropScience has announced it is to purchase AgraQuest, Inc. for \$425 million plus milestone payments. US-based AgraQuest is a global supplier of innovative biological pest management solutions based on natural microorganisms. Bayer says the acquisition will enable it to build a leading technology platform for 'green' products. It will also strengthen the company's strategically important fruit and vegetable business, while opening new opportunities in other crops and markets. The acquisition is subject to approval by the relevant authorities.

"The growing fruit and vegetable market, which today accounts for more than 25% of our sales, is of strategic importance. We plan to achieve €3 billion sales in this segment by 2020 and with the acquisition of AgraQuest we are underlining our growth ambitions," said Sandra Peterson, CEO of Bayer CropScience. "We are the first in the industry to offer farmers a truly comprehensive range of integrated crop solutions based on seeds, traits and a combination of chemical crop protection and biological control," she added.

The AgraQuest product portfolio includes well-established product brands such as the fungicides *Serenade*, *Rhapsody*, *Sonata* and *Ballad* and the insecticide *Requiem* which will complement Bayer's product offering. Several new pipeline products, which include acaricides, fungicides and nematocides are under development, and have undergone successful early field evaluations. Through the acquisition Bayer CropScience will integrate AgraQuest's state-of-the-art biopesticides production facility in Tlaxcala, Mexico, as well as the company's R&D site in Davis, California. AgraQuest employs a total staff of approximately 250 full-time employees.

AgraQuest's tailor-made portfolio and promising R&D pipeline will help Bayer to bring a new generation of innovative products to the market. "The acquisition will expand our existing biological pest control portfolio currently centered on our successful *Votivo*, a biological nematocide, and it allows us to further leverage the biotechnology platform we have acquired through Athenix Corporation," said Ms Peterson. "We are proud to become part of Bayer CropScience," AgraQuest CEO Marcus Meadows-Smith commented. "By joining forces we will be able to develop revolutionary, tailor-made biological solutions."

AgraQuest products are available today in more than 30 countries including Canada, US, Mexico, Brazil and European countries including the UK, Germany, France and Italy. They are used in diverse market segments such as fruits and vegetables, broad-acre crops, post-harvest protection, turf, home and garden and animal health. The company currently has its own sales force in the NAFTA crop protection market, and sells its products through a network of distributors and partners in other global regions.

AgraQuest's major shareholders include Otter Capital, TPG Biotech, Loudwater Investment Partners, Generation Investment Management, Halcyon Capital, SwissRe and several Swiss sustainable investment funds.

BAYER ACQUIRES US-BASED MELON BUSINESS

Bayer has been active on a number of other fronts during June 2012 which have further strengthened its fruit and vegetable business. The first is the acquisition of the watermelon and melon seed business of Abbot and Cobb, a privately-held seed company headquartered in Feasterville, Pennsylvania, US. Bayer says this acquisition will strengthen its Nunhems seed brand. Abbott & Cobb has a robust watermelon position in the US with increasing business in Mexico, Australia and Asia. The melon business and the germplasm will broaden Bayer's existing seed portfolio further and will be the basis for future new hybrids. Abbott & Cobb will continue with its remaining business with crops such as sweet corn, pepper and squash. Around 30 employees of Abbott & Cobb are expected to join Bayer.

BAYER INAUGURATES NEW LABS FOR VEGETABLE RESEARCH

Bayer CropScience has also opened new laboratories as part of the expansion of its vegetable R&D centre in Leudal, the Netherlands. With an investment of €12 million, the existing research building has almost tripled in size to 6,400 square meters. There are state-of-the-art laboratories for seed technology, cell biology and molecular breeding research as well as high-throughput biotech services. At the opening ceremony, CEO Marijn Dekkers highlighted the Group's commitment to

horticulture and healthy food. “We aim to provide growers and consumers across the world with answers for resource-efficient production as well as with healthy and flavourful vegetables,” said Mr Dekkers. Bayer vegetable seeds, are also sold worldwide under the Nunhems brand.

In addition to the facility in Leudal, Bayer CropScience has a second vegetable research centre in Davis, California. Both centres work closely with 26 vegetable breeding stations spread across the world, and two additional high-throughput service centres, one located in the US in Brooks, Oregon and the other in Bangalore, India.

Bayer’s Nunhems portfolio consists of some 2,500 varieties in 28 vegetable crops, including leading varieties of carrot, cucumber, leek, lettuce, melon, onion, pepper, tomato and watermelon. With more than 1,700 employees, the business has a presence in all major vegetable production areas in the world.

EUROPEAN NEWS AND MARKETS

DOW INTRODUCES NEW BLACKGRASS HERBICIDE

Dow AgroSciences is now marketing its new blackgrass herbicide in the UK under the trademark *Unite*. First announced last year under the code name GF-2070 (*CPM August 2011*), the herbicide is based on a combination of pyroxsulam and flupyrsulfuron-methyl. Stuart Jackson, cereal herbicide specialist, explained that while *Unite* is “designed to tackle blackgrass” it offers the widest spectrum of grass weed control there is for both nationally and locally problematic weeds, ryegrass, wild oats, brome spp, loose silky bent, canary grass, couch (from seed) and meadow grass. The product also controls a wide selection of broad-leaved weeds and includes volunteer beans and volunteer oilseed rape. He said: “The ideal timing for product is in the autumn. The key is to use *Unite* as part of a programme beginning with a residual product pre-emergence, such as flufenacet applied at least 240g ai/ha.” For best results *Unite* should be tank mixed with a residual herbicide such as *Stomp Aqua* applied at a minimum of 1.75 l/ha and one of a wide range of approved adjuvants. Dow AgroSciences stresses that as *Unite* is an ALS herbicide it is important to use the product within a programme and within the weed resistance action group (WRAG) guidelines. There are relatively few limitations on following crops.

MONSANTO LAUNCHES NEW GLYPHOSATE FORMULATION

Monsanto has launched the new glyphosate formulation *Roundup Flex* in the UK. Although already marketed in the US this is the first introduction of the formulation in Europe. *Roundup Flex* is a high concentrated formulation based on a new unique blend of surfactants with the potassium salt of glyphosate. It is claimed that the surfactant system, whilst maintaining highly efficient activity at the leaf surface, produces a synergistic improvement in overall *Roundup* liquid performance. The formulation contains 480 g/l glyphosate, present as 588g/l of the potassium salt.

The use of the potassium salt allows *Roundup Flex* to be highly concentrated but it is still of low viscosity. The product has demonstrated excellent performance in a wide range of challenging application and storage conditions such as very cool, hot or very dry and where reliable results can sometimes be difficult to achieve. Monsanto says that the herbicide is the first *Roundup* formulation to incorporate drift reduction properties. Rainfastness is one hour for annuals and four hours for perennials.

SYNGENTA EXPLAINS BENEFITS OF WEB-BASED SERVICES

In 2010 Syngenta Crop Protection announced at the UK *Cereals* event an on-line communication service available to growers (*CPM June 2010*). The regularly updated data included spray window advice, regional weather service, application advice and more general features such as commodity prices. Syngenta was also then the first of the agrochemical companies in the UK to set up a social networking facility. After two years Edwina Mullins, digital marketing manager at Syngenta, explained at this year's event, *Cereals 2012*, how the benefits of the web based services were proving of value to advisors, particularly the weather information.

The most interesting advancements have been made with the adoption of Facebook and Twitter. Syngenta's Facebook link is proving to be mainly of value to students. Twitter, however, has generated much greater response from growers. The company now has over 1700 followers and since Syngenta set up the Twitter account a number of other distributors and organisations have followed. Edwina Mullins explained that the objective is to establish industry wide adoption. What proves of particular value to the company is that by tracking the sort of queries and comments posted by growers it is possible to more efficiently respond to the market requirements. Compared to elsewhere in Europe Syngenta UK is leading the way in the adoption of social networking as a marketing tool. Only in North America is adoption more advanced.

SYNGENTA TO INVEST IN NEW SEED PROCESSING PLANT IN ARGENTINA

Syngenta is to invest \$50 million in building a new processing plant for corn and sunflower seeds in Argentina. The announcement followed a meeting between President Cristina Fernandez de Kirchner and Mike Mack, CEO of Syngenta, which confirmed the company's long term commitment to Argentine agriculture. The plant, located in the country's central region, will supply Argentina and other key markets globally. It will create over 2,000 jobs, including 350 direct employees.

Syngenta is also expanding facilities at seed production farms and continues to invest in seed development at its network of field stations. Total investment over the next 12 months will be close to \$100 million. Mike Mack said: "With its wealth of agricultural resources, Argentina is ideally placed to help satisfy growing global demand for food and feed. This latest investment by Syngenta follows our recent introductions of innovative seed technologies and further demonstrates our commitment to the Argentine market, as well as our confidence in the global growth of our corn and sunflower businesses."

CERTIS UK ON THE MOVE

Certis UK has re-located its offices from Wiltshire to Cambridge. It says this provides a more central location, closer to key clients, in particular in the arable sector, which represents an important part of the company's future strategy. The new offices are located on the Granta Science Park to the south east of the city. In addition to the UK team some of the Central Management team will be based here so it will effectively operate as the joint HQ for Certis Europe, along with the Maarssen office in the Netherlands.

EXOSECT'S MATING DISRUPTION TECHNOLOGY APPROVED IN ITALY

Exosect, a leading provider of Intelligent Pest Management solutions, has announced that its *Exosex OFM* mating disruption technology has received registration for commercial use in Italy. *Exosex OFM* is a unique pheromone technology which controls oriental fruit moth (*Grapholita molesta*), a major global pest of pome and stone fruit. It is specifically designed to control the moth as part of an integrated pest management strategy and in doing so, assist growers in reducing insecticide residues. *Exosex OFM* employs *Entostat*, Exosect's patented delivery platform, which delivers and disseminates minute quantities of oriental fruit moth female sex pheromone throughout the pest population, this in turn prevents mating and subsequent fruit damage. This product is one of a suite of mating disruption products which Exosect have developed using *Entostat* technology. Exosect's managing director, Martin Brown, commented: "Over many years we have worked hard to develop a range of pheromone based insect control products using *Entostat* technology. It is fantastic news that *Exosex OFM* can now be made available to Italian growers as a valuable Integrated Pest Management tool for reducing insecticide use in their orchards".

SYNTECH EXPANDS IN CENTRAL EUROPE

SynTech Research has opened new field trials sites in Poland. These are located at Piaseczno in the mid-east of the country and Labiszyn in the mid-west. The sites will allow the company to provide trials on targets in the key crops grown in the region including cereals, maize, sunflowers, vegetables, fruit crops, potatoes, oilseed rape, ornamentals and turf. Together with its locations in Hungary, Austria and the Czech Republic, the addition of the Polish sites means that SynTech Research now has a comprehensive presence for GLP and GEP field trials in Central Europe.

AMERICAN NEWS AND MARKETS

BASF'S HERBICIDE ZIDUA IS APPROVED FOR CORN

BASF Crop Protection has received US federal registration for its herbicide *Zidua* (pyroxasulfone) for the control of small-seeded broadleaf weeds and grasses in corn. Further registrations for use in soybean and wheat are anticipated in early 2013. The herbicide is also being evaluated for uses in sunflowers, peanuts and other crops. Based on 10 years of research and field trials, BASF says that the residual weed control provided by *Zidua* lasts up to two weeks longer than other herbicides currently on the market. The company also claims that research has shown that the herbicide provides up to 10% better performance than other residual herbicides in controlling Palmer amaranth and waterhemp. Nine states in the Southern US have already reported resistant Palmer amaranth, and herbicide options for control have become increasingly limited. Meanwhile, glyphosate-resistant waterhemp is continuing to spread across the country. Of the ten states that have now confirmed glyphosate-resistant waterhemp, three have waterhemp populations with resistance to multiple sites of action.

Bryan Perry, marketing manager for *Zidua* said: "With this herbicide growers have an additional site of action that provides outstanding residual control of small seeded broadleaves and grasses resistant to ALS-inhibitors, glyphosate, ACCase and triazines. Along with other herbicide innovations such as *Kixor* (saflufenacil), *Zidua* helps meet the growers' need for new herbicides with different sites of action to manage weed resistance and better protect their fields." *Zidua* can be tank-mixed with *Kixor* products to form a preplant and preemergence combination that combats tough, resistant weeds with up to three different sites of action.

US EPA APPROVES SYNGENTA'S VIBRANCE SEED TREATMENT

The US Environmental Protection Agency (EPA) has approved Syngenta's seed treatment *Vibrance* for use on cereals, soybeans and canola in the US. The company says the new fungicide active ingredient sedaxane delivers enhanced disease protection, including best-in-class Rhizoctonia activity. "*Vibrance* is a great addition to our Seedcare portfolio and will enhance our industry-leading line of fungicide seed treatment products," said Chad Shelton, brand asset lead for Seedcare at Syngenta. The company describes the mode of action from the SDHI class of fungicides as *Rooting Power*. The treatment helps produce more even emergence, improves nutrient and moisture uptake, and develops stronger plants. As a result, crops are better able to withstand the stresses of the growing season to deliver more consistent yield performance.

"Syngenta scientists and researchers worldwide have been analysing interactions between roots, diseases, moisture efficiency and nutrient utilisation," explained Dr Palle Pedersen, Seedcare technology manager. "We are learning that a simple act like effectively protecting crop roots from disease with a quality seed treatment fungicide like *Vibrance* can have an enormous impact on the overall health of the plant." "Rhizoctonia infects the entire root system," explained Dr Tim Paulitz, research plant pathologist with the USDA-Agricultural Research Service at Washington State University. "The pathogen hides out in dead roots and when the soil's moisture level and temperature have become favourable it kills the root tissue, the root tips and the root cortex before invading the entire root system." *Vibrance* delivers enhanced disease protection against Rhizoctonia root rot and other yield-robbing diseases like true loose smut in barley to protect roots and help ensure consistent yield performance.

BAYER RUNS FIELD EVENTS FOCUSED ON ROTATION

To help cultivate ideas and answers to herbicide resistance problems, Bayer CropScience and its university partners in the US have scheduled 12 *Respect the Rotation* field day events for 2012 at research facilities and farms throughout the Midwest and South. Now entering its third year, *Respect the Rotation* promotes rotation of crops, herbicide-tolerant traits and herbicide modes of action to encourage greater diversity in herbicide programmes and to reinforce the principles of Integrated Weed Management. These in-field forums allow farmers and industry experts to bring the laboratory to the field and learn the real impact of weed resistance issues. The initiative aims to help change mindsets and management practices to help sustain profitability for farmers, as well as maintain the value and effectiveness of current herbicide programmes and trait technologies.

During the 2011 programme more than 1,000 farmers, retailers and crop consultants saw the impact that herbicide-resistant weeds can potentially have on their farming operations and profits. "*Respect*

the Rotation was set up to raise the profile of weed resistance in the US,” explained Andy Hurst, trait product manager for Bayer CropScience. “Weeds resistant to glyphosate and other herbicides are a huge threat, not only to weed management, but also to efficient production of row crops. Farmers need to stay ahead of this curve, adopt good weed management practices like the rotation of the *LibertyLink* trait into their crop production plans, and hopefully preserve the value of technologies they have currently available to them.”

“We carried out some survey work to determine the incidence of glyphosate resistance in waterhemp, as well as the incidence of multiple resistance to two other herbicides,” says Pat Tranel, weed scientist with the University of Illinois. “Glyphosate resistance was confirmed in 83% of the fields in Illinois where resistance was suspected, and that’s not really surprising. The bottom line is if you suspect you have resistance to glyphosate, you probably do. You probably also have resistance to ALS inhibitors, and you have a one-in-three chance of also having resistance to PPO inhibitors.”

CANADA RE-EVALUATES NEONICOTINOIDS

The Canadian Pest Management Regulatory Agency (PMRA) is to reevaluate the environmental risks posed by three neonicotinoid insecticides, focusing particularly on risks to bees and other pollinators. The insecticides clothianidin and thiamethoxam will be reassessed as a cluster, together with imidacloprid, which is already under review. The reassessment will cover all agricultural uses of the insecticides, including seed treatments and soil, foliar and greenhouse applications. It is being initiated in light of “changes in the information required and global updates to the pollinator risk assessment framework,” the PMRA points out. There continues to be emerging science on neonicotinoids and their potential effects on pollinators, it adds. The PMRA is collaborating with international regulatory partners to discuss further data requirements for the development of enhanced risk assessment methods and risk mitigation measures for pollinators.

NEW BAYER SEED TREATMENT FOR SOYBEANS

EverGol Energy (metalaxyl + penflufen + prothioconazole), recently registered for use on soybeans in the US by the EPA, has multiple modes of action and provides enhanced protection against a broad spectrum of early-season diseases. “The launch of *EverGol Energy* demonstrates Bayer CropScience’s commitment to providing innovative seed solutions to farmers, and our relationship with Pioneer provides another opportunity to deliver on that promise,” says Ethan Luth, corn and soybean product manager at Bayer CropScience. The new fungicide seed treatment is included in the Pioneer Premium Seed Treatment (PPST) programme. It increases the options available to Pioneer soybean customers. Other PPST offerings include insecticides, an insecticide + nematode protectant and a proprietary biological/polymer for more complete protection of the soybean seed.

“Pioneer conducts extensive research evaluations of a broad range of seed treatment products under different growing conditions throughout the soybean-producing areas,” said Warren Richardson, senior marketing manager for North America seed treatments. “*EverGol Energy* fungicide meets those high standards and complements Pioneer’s high-yielding soybean genetics.”

OTHER NEWS AND MARKETS

ARYSTA TO ACCESS FLOXASTROBIN FROM BAYER

Arysta LifeScience has signed an agreement with Bayer CropScience for the global licensing and sale of fluoxastrobin, Bayer's patented strobilurin fungicide. Under the agreement, Arysta will gain exclusive access to the fungicide for all crop and non-crop applications except seed treatment and certain proprietary Bayer mixtures. Arysta LifeScience first licensed fluoxastrobin from Bayer in 2005 for development in the US, Canada and Japan. The company has successfully launched and marketed two brand families *Disarm* and *Evito* based on the active ingredient. Arysta now intends to build on that success by both leveraging existing products and developing new fluoxastrobin products in all six of its business units around the world.

"Fluoxastrobin is a very versatile fungicide and a valuable tool for growers," said Paula Pinto, head of global marketing, Arysta LifeScience. "It provides broad-spectrum disease control and has demonstrated excellent plant health properties. We intend to develop the fungicide for use in a wide range of crops including corn, soybeans, wheat, potatoes, vegetables, sugarcane, pome fruit and turf."

DUPONT RECEIVES TEMPORARY REGISTRATION FOR FUNGICIDE IN CHINA

The Chinese Institute for the Control of Agrochemicals, Ministry of Agriculture (ICAMA) has granted a temporary registration for DuPont's fungicide picoxystrobin, which will last for one year. Picoxystrobin, a strobilurin fungicide, was initially introduced by Syngenta for control of yellow, brown and crown rusts, powdery mildew, sooty mold, net and leaf blotch and tan spot on cereal crops, including wheat, barley and oats in Europe in 2001. In 2006, the product was sold to DuPont in return for access to the insecticide chlorantraniliprole for use in mixtures. Picoxystrobin is currently registered in some 28 countries, including Argentina, Austria, Belgium, Brazil, Colombia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Kenya, Latvia, Lithuania, the Netherlands, New Zealand, Norway, Poland, Romania, Slovakia, South Africa, Sweden and the UK. Registration is ongoing in the US, Italy and Portugal. DuPont has estimated its peak year sales potential for picoxystrobin to be \$150 million.

BIOPESTICIDE MARKET TO GROW

Bioinsecticides, biofungicides and bionematicides are rapidly growing markets segments which are expected to boost the overall use of biopesticides in the near future. Increasing demand for residue free crop protection products, which have lesser or no negative impact on environment and better safety features are key drivers. Growth in the organic food market and simpler registrations are other important factors. The report *Global Biopesticides Market - Trends & Forecasts (2012 - 2017)* published by MarketsandMarkets (www.marketsandmarkets.com) defines and segments the global biopesticides market. It forecasts the global revenue for biopesticides, identifies the driving and restraining factors and analyses trends, opportunities, current issues and challenges. The report values the global biopesticides market at \$1.3 billion in 2011 and it expects sales to reach \$3.2 billion by 2017, growing at a CAGR of 15.8% from 2012 to 2017. North America currently dominates the market, accounting for around 40% of demand in 2011. Europe is expected to be the fastest growing market in the near future owing to the more stringent regulations for chemical pesticides and increasing demand for organic products.

SYNGENTA TO MODERNISE SWISS HEADQUARTERS

Syngenta is making a significant investment in the modernisation of its headquarters in Basel, Switzerland. For some 1,500 Syngenta employees on the site, who represent more than 50 nationalities, the modernisation will result in a contemporary working environment that reflects the company's focus on innovation. Syngenta announced in 2010 the renovation of two office buildings, including the creation of multi-office areas; work on these has already begun. A more comprehensive redevelopment of the Rosental headquarters was subsequently approved by the Syngenta Board of Directors in May 2012. The redevelopment will incorporate an integrated conference and meeting area, new restaurant facilities and a large outdoor green space. Building permits for these projects were recently issued to Syngenta by the Canton of Basel Stadt. In addition, plans are being drawn up with a renowned architect for an additional office building and visitors' entrance facing on to the Schwarzwaldallee. A full proposal will be submitted to the City of Basel building department and the cantonal authorities over the coming months.

SYNGENTA ADOPTS NEW SEGMENT REPORTING

Syngenta will adopt new segment reporting of sales and profitability starting with the first half 2012 results, to be announced on 26 July. The new segments reflect the company's integrated strategy and aligns reporting with previously announced changes in management structure. As such, segment reporting is based on the four geographic regions, with the exception of the global Lawn and Garden business which is reported separately. The boundary between marketing and distribution, and research and development expenses has also been redefined. Syngenta's global research and development organisation now manages all field trial sites and activities worldwide, including those related to maintaining product registrations. In order to maximise cost efficiency, the provision of support services in finance, information systems, HR and indirect procurement has been centralised through Syngenta Business Services. The allocation of costs for these services at a regional level is based on the level of transactional activity in revenues and costs, with revenue-related charges included in marketing and distribution. Some costs of the integrated organisation do not relate to a geographic destination and are reported as non-regional. These include global marketing teams, research and development and corporate headquarter functions.

SYNGENTA ENTERS BARLEY BREEDING COLLABORATION

Syngenta has entered into a barley breeding collaboration with InterGrain, an Australia-based crop breeding company. The collaboration will enable Syngenta and InterGrain to exchange germplasm to develop innovative integrated solutions for barley growers across the world. Syngenta will gain exclusive global commercialisation rights for all new barley varieties developed, and exclusive rights to commercialise existing varieties in the InterGrain portfolio outside Australia.

"We are building on the strength of our broad portfolio to realise untapped technology potential for the benefit of the grower," said John Atkin, Syngenta COO. "This collaboration will enable us to share our complementary assets and capabilities and to develop innovative crop-based agronomic solutions that will offer unparalleled quality and yield for barley growers across the world." Following some 20 years of investment in barley, Syngenta is committed to reinforcing its global leadership in the crop by continuously developing new technologies tailored to the needs of the grower. The primary focus of InterGrain is to provide the Australian grains industry with access to elite varieties and to enable growers to compete effectively in domestic and international markets.

DUPONT TO BUY MAJORITY SHARE IN PANNAR SEEDS

The DuPont seed business, Pioneer Hi-Bred, and Pannar Seed (Pty) Limited, a South African-based seed company with operations throughout Africa and other parts of the world, have been given approval to implement the agreement that sees Pioneer purchase a majority share of Pannar. The South African Competition Appeal Court announced its approval of the transaction, overturning an earlier decision by the South African Competition Tribunal.

The transaction has already been approved by the competition authorities in other African countries where approval was required, including Kenya, Malawi, Namibia, Swaziland, Tanzania and Zambia. "This is good news for our customers, for our employees and for South Africa," said Brian Corbishley, chairperson of Pannar. "Pioneer is the ideal partner for the long-term growth of our business. This is a substantial investment of capital and expertise in South Africa and a vote of confidence in the future potential of agriculture in Africa." "It's an excellent fit of two seed businesses with similar cultures. Together with Pannar, we can increase investments in innovative products and services for farmers across Africa," said Pioneer president Paul E Schickler. "This will enhance productivity and improve food security as we utilise the strength of our two businesses to accelerate the development of higher performing products for Africa's farmers."

Approval of the transaction is subject to a number of conditions that Pioneer and Pannar have committed to, including significant, long-term investment in South Africa. In addition to its investment in Pannar, Pioneer has committed R62 million (South African Rand) (\$7.5 million) by 2017 to establish a regional research centre in South Africa that would bring advanced R&D breeding technologies to Africa and apply these technologies to the companies' complimentary germplasm pools. The research centre will be similar to the innovative centres that DuPont has established in Brazil, India and China and will allow South Africa the opportunity to play a leading role in agricultural development for the African continent.

Pioneer and Pannar have further committed to working with communities, government and other groups to develop programmes addressing the challenges faced by small-scale and developing farmers to increase their overall farm productivity, profitability and food security. Pioneer has committed R20 million over six years toward programmes, in addition to its current endeavours, that will benefit developing farmers in South Africa.

The merger will allow each business to access additional crop areas, reach more customers and deliver improved seed products quicker and more efficiently than either could have achieved on its own. Pannar receives access to Pioneer's genetics library and its maize breeding and biotechnology capabilities which will benefit its Africa operations and its operations in the US and Argentina. Pioneer will tap into Pannar's expertise and reach across Africa and its maize genetics developed specifically for the region.

With nearly 80 million acres (32 million hectares) available for maize production, Africa represents a significant opportunity for improved productivity. Average grain yields are less than two tons per hectare, about one-third of what is achieved in other developing regions and only one-fifth of yields in developed countries. In addition, maize seed demand is strong and growing. In South Africa alone, annual hybrid maize seed sales total about \$300 million.

With this partnership, South Africa will become an important centre of innovation for Pioneer. Pioneer will therefore have the incentive to invest further in research and development in order to continue to develop the best products for farmers in South Africa and Africa. As the business expands, additional investments in infrastructure and capacity will be driven by increased business success.

This investment is part of the DuPont strategy to deliver innovative solutions for some of the world's most important challenges, including the need for increased food production. Last month in conjunction with the G8 Summit, DuPont committed to the New Alliance for Food Security and Nutrition by announcing an investment of more than \$3 billion over the next three years to help smallholder farmers in Ethiopia achieve food security (*May CPM*).

MONSANTO POSTS HIGHER THAN EXPECTED PROFITS

Monsanto has posted a higher than expected third quarter profit as its net sales revenue grew 17% to \$4.2 billion with gains in sales of seeds and genetic traits and in herbicides. Reported sales of corn seed and genetic traits increased by 3%. This included a rise in soybean sales of some 15% and gains in chemical products of 16%. Monsanto said it benefited from an increase in US planted corn acres this spring, as farmers rushed to respond to strong global demand. US farmers planted an estimated 96 million acres of corn this spring, the most in 75 years, according to the US Department of Agriculture.

Longer term, the increasing global population is an opportunity for rapid growth in Monsanto's agricultural seeds and traits business, said chief executive Hugh Grant. The company's efforts to develop seeds that perform better under adverse conditions and its work with herbicide-tolerant and insect-resistant crops puts it in a good position to benefit from the growing demand for food, livestock feed and ethanol. "The global drivers of agricultural growth are real and they are ongoing," said Mr Grant. "That creates a lot of opportunity for a long, long time."

Two of the company's key new products were planted on higher than projected acres this year - some 25 million acres for its *Genuity* reduced-refuge corn and about 30 million acres for its *Roundup Ready 2 Yield* soybeans, up from 17 million acres in 2011.

One disappointment was the company's vegetable seed sales, which declined by about 10% year on year. Last year the company launched a genetically altered sweet corn that tolerates treatments of the herbicide *Roundup* herbicide but this met with some consumer resistance.

REPORT PREDICTS GROWTH OVER NEXT FIVE YEARS

According to Lucintel, a leading global management consulting and market research firm, the global agrochemical industry is expected to reach \$68.5 billion in 2017 with a CAGR of 5.5% over the next five years. A rise in the global demand for nutritious and high-quality food and the shortage of arable land is expected to drive the agrochemical industry over the forecast period. Lucintel has analysed the market and presented its findings in "*Global Agrochemical Industry 2012-2017: Trend, Profit, and Forecast Analysis*". Its research indicates that agrochemicals have significantly increased farm

productivity in both developed and developing countries. Increased production of soybeans and sugarcane in Latin America is also driving growth.

Lucintel forecasts that APAC will witness the highest growth during the next five years. Asia and the Rest of the World also represent growth opportunities. Research identifies China, India, Brazil and Argentina as key growth areas during the forecast period. Countries in the APAC region such as China and Thailand are projected to post strong growth in agricultural output, which will ultimately boost the industry. Fungicide products based on innovative technology offer efficient and long-lasting disease control and have positive effects on plant physiology, which in turn increases their adaptability globally.

Lucintel's research report categorises the global industry for agrochemicals on the basis of application and geography. On the basis of application it tracks three industry segments, insecticides, fungicides, and herbicides in four geographic regions. The scope of the study is limited to annual trends for the past five years and forecasts for the next five years.

DISEASE CONTROL IN AUSTRALIAN CROPS PREVENTS CROP LOSS

Two new reports *The Current and Potential Costs from Diseases of Oilseed Crops in Australia* and *The Current and Potential Costs from Diseases of Pulse Crops in Australia*, commissioned by the Grains Research and Development Corporation (GRDC) show that diseases in Australian pulse and oilseed crops are inflicting production losses of more than Australian (A)\$210 million (\$214 million) a year. The reports indicate that the economic impact would be far worse if current controls were not in place. Breeding programmes for blackleg management in canola alone are saving growers A\$123.6 million annually in potential losses, with cultural practices and fungicides preventing further losses of A\$63.8 million and A\$67.2 million respectively.

The GRDC reports by Gordon M Murray and John P Brennan also state that breeding programmes for Ascochyta blight management in chickpeas are preventing potential additional losses of A\$15.7 million annually, while cultural practices and fungicides save the industry A\$6.9m and A\$12.4 million respectively in Ascochyta losses each year. The current loss from diseases in oilseeds averages A\$137 million per year, or 27.6% of the gross value of oilseed production, while pulse diseases are responsible for annual losses averaging A\$74 million per year, or 14.8% of the gross value of Australian pulse production. The oilseed crops included in the studies were canola, soybeans and sunflowers, while the pulse crops included were narrowleaf and albus lupins, field peas, chickpeas, faba beans, lentils, vetch, peanuts and mungbeans.

Production losses due to diseases caused by fungi, nematodes, bacteria, viruses and phytoplasmas would be far greater without current controls such as the use of resistant varieties, crop rotation, paddock management and the use of pesticides, according to the reports. The GRDC is funding much of the research into these diseases and the development of appropriate control measures. According to the reports, for the five years ending 2008-09, the average gross value of national oilseed production was A\$552 million per year from an average area of 1.3 million hectares. Over the same period the average gross value of Australian pulse production was A\$503 million per year from an average area of 1.5 million hectares.

The GRDC has previously commissioned assessments of the disease losses to the Australian wheat industry (average A\$913 million per year or 19.5% of the value of production) and to the barley industry (A\$252 million per year or 19.6% of the value of production).

CONFERENCES AND FEATURES

BAYER TO EXTEND PRESENCE IN SEEDS AND TRAITS

Lykele van der Broek, chief operating officer at Bayer CropScience, gave a presentation to invited press representatives at Cereals 2012. He has responsibility for overseeing Bayer's worldwide Crop Protection business as well as the BioScience division (seeds and traits). Mr van der Broek is a member of the Executive Committee of Bayer CropScience.

Mr van der Broek explained how the industry expenditure on R & D continues to grow. Bayer spends close to 10% of its revenue on R&D, more than €700 million annually. The company is a global leader in crop protection but not in seeds and traits. Bayer has therefore embarked on a strategy aiming to increase its presence in seeds and traits.

The strengths of the company in terms of traits are in cotton, with a 40% global market share, vegetables and in North America, canola. Mr van der Broek explained that Bayer has also attained a major market share in hybrid rice varieties. Although hybrid rice is commercially still under-developed it offers significant benefits in terms of productivity.

Bayer's presence in Europe with seeds and traits is relatively low. However, a number of new initiatives have been announced. The acquisition of the oilseed rape business of the seed company Raps GbR, Schleswig-Holstein, Germany was completed last October. This will enable Bayer to extend its presence in Europe by coupling with the benefits of breeding technologies and traits already developed through its activities in North America. The first improved varieties for the European market will be in 2015.

A longer term ambition globally and for the European market is to introduce new wheat traits. Productivity increases in wheat in Europe have tended to stall in recent years. Gains can be expected through the use of modern breeding techniques but longer term there is scope for bringing in new traits such as drought tolerance, disease and insect resistance. Much of the R&D work already underway is through collaborations with external organisations such as CSIRO in Australia and Evogene from Israel. The use of wheat germplasm from Ukraine which offers improved stress tolerance has been identified as one development route to be followed. Mr van der Broek emphasised that the first commercial introductions of enhanced wheat varieties would probably not be before 2020. An important objective for Bayer is to strengthen its relationship with growers. The emphasis on the promotion of stewardship schemes helps to achieve this. The company is also committed to developing partnerships along the food chain and has established links with multinational food companies such as PepsiCo. In a number of cases Bayer has helped food importers to source produce from growers known to be adopting only the safe and legal use of agrochemicals.

The defence of the regulatory status of existing crop protection products is absorbing an increasing proportion of Bayer's R&D expenditure. Mr van der Broek told *Crop Protection Monthly* that this is proving a threat to the industry in Europe.

In closing he summarised Bayer's business aims: to strengthen its position in the crop protection sector; to enhance customer orientation – along the entire food value chain and particularly with industrial growers; to step up innovation and to extend the presence in seeds and traits.

BIOTECH SOY IN THE AMERICAS

The United States Department of Agriculture (USDA) recently hosted a seminar in London to promote the benefits of GM crops to an invited audience of farmers, academics, poultry producers, agrochemical companies, international food businesses, consultants and trade associations with membership in the food and feed trades. The presentations were made by International Soy Growers Alliance (ISGA) (www.globalsoygrowers.org) which is made up of growers and industry representatives from Argentina, Brazil, Paraguay, Uruguay and the US. The members share a commitment to meet the rapidly increasing world demand for quality and healthy products from the soybean crop. Roger Turner, a consultant with the Food Chain Research & Technology Network (www.foodchaintech.org) reports.

ISGA represents around 90% of the global supply of soy products. It promotes best practice for the soybean supply chain. Its representatives are lobbying the EU Commission and key member states namely Germany, France and the UK in the hope that a more science based approach will be made to GM crops. ISGA listed the benefits arising from GM soybeans. These include reductions in chemical and fuel use, labour inputs, machinery wear and tear, soil erosion, and greenhouse gas emissions as well as improved soil health improved air quality and more wildlife on farm. ISGA reminded delegates that after 16 years of GM soy in food and feeds there have been no validated cases of human health concerns. GM soy production had increased by 147% and GM maize by 83%.

The EU imports 11.4 million tonnes each year of soybeans and 21.9 million tonnes of soy meal products from ISGA member countries. ISGA reminded the audience that the issue of the adventitious presence of GM in non-GM foods and feeds was not practical for international commodity trade and needed resolution. The supply chain from a South American soybean grower to a European customer requires eight different analyses to confirm the absence, ie below 0.1%, of GM. They hinted that a legal challenge may be required to clarify and resolve this issue. Around 91 million tonnes of commodity products were involved in the world supply chains. China was becoming a major importer of soybean to meet the needs of its population and is a potential threat to EU imports of soy.

In the US the growth in GM soy has been spectacular. In 1996 only 2% of the crop was GM but in 2012 this has grown to 94%. There are 14,000 gathering points in the US supply chain (mostly grain elevators) and co-mingling of products is extensive. The US exports its soy to 37 different countries around the world including the EU. The key regulatory agencies are the Environmental Protection Agency (EPA), Food and Drink Administration (FDA) and the USDA and all of these work to very high standard of public safety.

The ISGA members from Argentina, Brazil, Paraguay and Uruguay all gave individual presentations. It is not easy to generalise from such a large and agriculturally diverse region but there were clear and constant themes emerging. All countries are seeing the environmental benefits. With the rolling terrain and landscapes of South America the reduction in soil erosion arising from no-till cultivation is significant. The reduction in use of agrochemicals is important since in warm tropical climates the necessity to wear protective clothing is also reduced.

All the countries are now developing new traits with both agricultural and food quality traits being listed. Each country has its own technical work to develop specific GM technology and to co-operate with the international businesses interests in their plant breeding efforts. ISGA expects that there will be around 125 new biotech events by 2015, a major issue for the regulatory agencies in ISGA countries and the EU. Brazil quoted some impressive socio-economic statistics. GM cropping had saved enough water to meet the needs of 500,000 people, saved enough fuel for 74,000 motor cars each year, and saved enough energy to meet the needs of 600,000 people. The Brazilian delegate pointed out that Brazil still had 65% of its native ecosystems, that only 4% of its area was urbanised and only 7% of its land was used in agriculture. He also pointed-out that Brazil was 27 times the area of the UK and larger in area that the whole of the EU.

The audience was particularly exercised by the lack of movement in the EU regulatory system and the fact that the EU was almost a GM free zone. Most delegates felt the major food retailers would not change their attitude to GM until consumers changed their views and started to seek out GM products. There was agreement that the public needed to be better informed and a discussion about how to do that. However, most present felt that it would not be an easy task. They believe that the public is increasingly sceptical on a range of issues and would most likely greet any change with a "Well you would say that wouldn't you"? Overall this was an interesting and challenging topic. In a more environmentally-aware society the benefits of GM cropping surely cannot be ignored for too long.

EU ZONAL REGISTRATIONS

The recent Informa conference on the Registration of Agrochemicals in Europe held in Brussels on 17/18 April included both a conference session and an evening seminar on the subject of zonal authorisation. Peter Chapman from JSC (www.jsci.co.uk) reports on the presentations.

The evening seminar entitled *A Practical Approach to Zonal Submissions* was presented jointly by Lucy Croucher, managing director of JSC International and her colleague Lesley Halford. The legally based zonal work-sharing procedure was introduced because mutual recognition as envisaged under Directive 91/414 did not work. The introduction of Regulation 1107/2009 provided the opportunity for the European Commission (EC) to implement a legally binding work sharing and mutual recognition procedure at a zonal level in order to achieve greater harmonisation between member states of product authorisations.

Prior to the full implementation of the Regulation, voluntary zonal work sharing was established on a limited basis. Guidance on this voluntary system was issued by the Commission in October 2009. Since 14 June 2011 all applications for new product authorisations and all national re-registrations for actives approved under Regulation (EC) No. 1107/2009 are subject to mandatory work sharing procedures and revised guidance. A revised Guidance document on zonal evaluation and mutual recognition under Regulation (EC) No. 1107/2009 (SANCO/13169/2010 rev. 5), was issued on 11 March 2010. Under the new system the zonal rapporteur member state (zRMS) has a clear role in coordinating the evaluation of the draft registration report (dRR) and will usually also carry out the zonal assessment. Where possible applicants are encouraged to appoint the same zRMS for products based on common active substances. The timelines for the procedure are challenging with the renewal of authorisation to be completed within 12 months of the renewal of approval of the active substance. The dRR should be submitted within three months of the renewal of approval, the zRMS then has six months to complete the core assessment, with member states having a further three months to complete national assessment, after receiving the core assessment from the zRMS.

JSC experience has shown that it is possible to send in the initial notification two to three months before submission of the dRR. In theory the notifier can express a preference for a zRMS; however, many countries are very busy with evaluation work and may refuse to take on the role. The final decision will be made by the Zonal Steering Committee. It is important to discuss issues arising with rapporteur member state (RMS) to determine its likely approach and options for resolution, in a pre-submission meeting. The GAP (Good Agricultural Practice) uses must be clarified at an early stage. Important considerations to be taken into account when selecting a zRMS include the location of the main market for products, existing relationships with the regulator, availability of local distributors and the fees charged.

The format for the notification has changed since the original guidance was issued in order to improve clarity particularly in relation to the information required in the GAP table. The dossier submission is made in the dRR format. This consists of a core assessment (to be evaluated by the zRMS), and national addenda. The core will include study summaries and a zonal 'risk envelope' assessment. Risk assessments must reflect current DG SANCO (Directorate General for Health and Consumer Protection) guidance documents. The national addenda will include risk assessments according to specific member state requirements, efficacy data, specific member state GAP, risk mitigation measures and draft proposed label.

The risk envelope approach will be used by member states in carrying out the evaluation of the dossier. This involves the principle of using a worst case situation in each area of assessment/compartiment, and will usually be different in each specialist area. Assessment of worst case product/use will cover all other situations where the GAP is the same or less critical. The intention is to minimise the number of individual product/use assessments that need to be completed. Where it is not possible to define the risk envelope for all areas of the assessment, eg fate and ecotox, an explanation is required. JSC experience is that the risk envelope driver should not necessarily be the worst-case GAP, as in some cases the worst-case is only found in a limited number of member states. In these cases it is then more appropriate to use a lower, but more widely used rate for the risk envelope. The more worst-case GAPs can be presented in the appropriate national addenda. More favourable GAPs can also be presented in the appropriate national addenda where more favourable mitigation can be demonstrated.

Some non-zRMS countries appear to be starting work ahead of the zRMS completing the core assessment leading to the possibility that the applicant receives questions from non-zRMS member

states at an early stage in the evaluation. It is advisable that if the zRMS requests the submission of supplementary information and/or an updated dRR, the same information should be submitted to the other member states in the zone and possibly in other zones, where relevant. Experience has shown that all consumer, operator, worker and bystander risk assessments should be provided in the core dossier, together with exposure assessments using FOCUS and ecotoxicological risk assessments. Specific member state modelling and mitigation and risk assessments taking into account exposure modelling should be presented in the national addenda. It is better to try to harmonise GAPs wherever possible and finalise the GAP well ahead of deadline for submitting the dRR, preferably before starting dRR preparation. For national re-registration, make it clear which are existing and which are new uses.

The EU is divided into three zones:

Zone A (North) - Denmark, Estonia, Latvia, Lithuania, Finland, Sweden

Zone B (Centre) - Austria, Belgium, Czech Republic, Germany, Ireland, Luxembourg, Hungary, Netherlands, Poland, Romania, Slovenia, Slovakia, United Kingdom

Zone C (South) - Bulgaria, Cyprus, France, Greece, Italy, Malta, Portugal, Spain

The conference received updates from member states in the three zones. For the northern zone Gunilla Ericson of the Swedish Chemicals Agency reported that experience to date had shown that pre-submission meetings prior to zonal dossier submission were beneficial. Such meetings allowed for discussion between the regulatory authority and the applicant on how data requirements (including confirmatory data) and data gaps should be addressed, how the risk envelope should be applied in relation to the intended GAP, and the timelines to be followed. In many cases it was apparent that the applications submitted were not complete and were not always in dRR format. In the northern zone the dRR was expected to include the core information for the zone in order for the rapporteur member state to evaluate as much as possible on behalf of the other countries in the zone. The additional time allowed in the procedure for submission of additional data was being used in most applications. It was also apparent that there was a large administrative burden on the zRMS in terms of tracking applications and coordinating inputs. The EU data base on applications that is currently under development would help in this regard. The dRR format is also currently being revised to take account of the experience gained to date.

Christian Prohaska from the Austrian regulatory authority summarised the zonal evaluation process on behalf of the central zone. He emphasised the need for applicants to harmonise their GAPs within zones as far as possible, changes during evaluation should be avoided wherever possible, and that all intended uses should be included in the core assessment. Co-operation and sharing of evaluations between zones needed to be improved. Communication between member states and between member states and applicants, the quality of dRRs provided by the applicant and risk harmonisation between member states also required some further improvement. Consideration of new annex II data should be avoided unless strictly necessary.

Léa Riffaut, on behalf of the French regulatory authority, confirmed the key messages coming from the southern zone. In addition she stressed the need for a different dRR to be submitted for each product for which an authorisation is requested and where a product has both indoor and outdoor uses two dRRs should be submitted, one zonal and one EU. The risk assessments must be conducted in the core dossier and should be sufficiently detailed to allow other member states to grant an authorisation. National addenda must be justified, limited and dedicated to specific risk assessment tools or specific national requirements.

For industry Euros Jones, regulatory affairs director at the European Crop Protection Association (ECPA), put forward the view that although national requirements were a major hurdle they were not a barrier to harmonisation. He said that opportunities exist to harmonise in the areas of environmental fate, ecotoxicology, operator exposure and efficacy. Over time it was industry's wish that national requirements are reduced. There were concerns over the inconsistent approach between member states in respect of mutual recognition of 91/414 authorisations and the possibility that member states may refuse to grant authorisations after refusal by the zonal rapporteur. Other areas that industry had identified as potential issues included self classification under classification and labelling legislation, vertebrate data sharing, and confirmatory data requirements.

During the subsequent discussion it was clear that there were considerable difference in procedure between the zones that needed to be resolved. Planning for handling of applications was essential as was good communication between all the parties involved. Industry should expect to have applications rejected if they were not up to standard.

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