Latin America Supplement 2015
(news, features and interviews)
**Top 20 Global Agrochemical Companies**

*Welcome To Our AgroChemEx 2015 Booth (1A29)  
Venue: Shanghai World Expo. Exhibition & Convention, China  
Date: Oct.28-30, 2015*

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**HERBICIDE**

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<tr>
<th>Herbicide</th>
<th>TC</th>
<th>TC, SC, WG, WP</th>
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<td>Glyphosate</td>
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<td>Glyphosate Isopropylamine Salt</td>
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<td>Glyphosate + 2,4-D</td>
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<td>Glyphosate MCPP</td>
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<td>Glyphosate + Diquat</td>
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<td>Diquat</td>
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<td>Quinclorac</td>
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<td>Glufosinate-ammonium</td>
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<td>Dimethoate</td>
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<td>Isocarboxyl</td>
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<td>Propamidone</td>
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**FUNGICIDE**

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<tr>
<td>Carbendazim</td>
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<tr>
<td>Thiophanate-methyl</td>
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<td>Myclobutanil</td>
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<td>Azoxystrobin</td>
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<td>Fosetyl-Al</td>
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<td>Tebuconazole</td>
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<td>Mancozeb</td>
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<td>Chlorothalonil</td>
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<td>Pyraclostrobin</td>
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<td>Cyproconazole</td>
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<tr>
<td>Pretricoconazole</td>
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**CHEMICAL PRODUCT**

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<tr>
<td>3,4-Dichloroaniline</td>
<td>99%</td>
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<td>1-Chloro-2-nitrobenzene</td>
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<td>O-Phenylenediamine</td>
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<td>3,4-Dichlorophenyl isocyanate</td>
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<tr>
<td>Sodium pyrophosphate</td>
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<tr>
<td>3,4-Dichloroanilide</td>
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<tr>
<td>O,O-Dimethyl Phosphate</td>
<td>99%, 98%, 97</td>
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<tr>
<td>Phosphorus Trichloride</td>
<td>99%, 98%</td>
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<tr>
<td>Phosphorus Oxichloride</td>
<td>99%, 98%</td>
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<tr>
<td>Sodium trioxophosphate</td>
<td>99%, Industrial grade</td>
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<tr>
<td>Methyl chloride</td>
<td>99%, 98%</td>
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**INSECTICIDE**

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<tr>
<td>Chlorpyrifos</td>
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<td>Chlorpyrifos + Aceatamiprid</td>
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<td>Chlorpyrifos + Cipermetherin</td>
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<td>Imidacloprid</td>
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<td>Aceatamiprid</td>
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<td>Buprofezin</td>
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<td>Lambda Cyhalothrin</td>
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<td>Abamecin</td>
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<td>Emamecin Benzoate</td>
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<td>Methomyl</td>
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<td>Carbaryl</td>
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This year will likely represent one of correction or worse in the Latin American agrochemical market. Reports from Brazil point to a major downturn in early sales. The region continued to set the pace in global agrochemical sales last year. In the 2013/14 season, Latin America recorded 15% growth to become the largest continental market at over $16 billion. Growth was led by the major markets of Brazil and Argentina. They accounted for almost 90% of the regional agrochemical market.

The 2013/14 season started with a shift in planting from maize to soybeans. A dry start to 2014 resulted in lower Asian soybean rust (*Phakopsora pachyrhizi*) pressure. That, along with a reduced sugar cane harvest and low crop prices, held back growth of the Brazilian market. Despite trade restrictions on crops and agrochemicals, the devaluation of the peso and high inflation, the Argentina market performed well as it benefited from better weather. The 2014/15 season again got off to a good start, although low maize prices affected planted acreages. Agrochemical market growth in “developing” Latin America was sustained.

The 2014 Brazilian market rose another 7% to top $12 billion. Despite high incidence of Asian soybean rust and of earworm (*Helicoverpa* spp) infestations, that represented a sharp decline on the previous year, and would be followed by a crash landing in the first half of this year. The Argentine market rose by 9% to $2.7 billion last year. Half the agricultural area that had weed problems presented resistance to glyphosate herbicide. Glyphosate continued to dominate the herbicide market, which was larger than any other segment. However, sales stagnated at around $1 billion.

A recent study reveals a steep drop in sales in the first half of 2015 in Brazil. Business was down by a quarter, although the industry holds out hope that a recovery will emerge as growers have delayed purchases on expectations of better deals. Key factors that have weighed on business include: high temperatures and a prolonged drought leading to lower pest pressure, the soaring cost of the US dollar/Brazilian real exchange rate and high stock levels in the supply chain. Access to credit has also become more restricted and expensive.

Imports crept higher in 2014, adding some 2% in the dominant Brazilian market to $7.3 billion and over 400,000 tonnes. Increased insect pressure, particularly from earworms, drove growth in insecticide imports above all. Imports into Colombia similarly grew by 3% to 23,000 tonnes.

**Approval reform**

The new Brazilian Minister of Agriculture has made the speeding up of pesticide approvals among her priorities in office. This follows proposals to streamline the process last year. The Ministry has proposed the creation of a single body to cover the evaluation process for the approval of pesticide active ingredients. The current framework involves three competent authorities, including the environmental agency, the Ibama, assessing environmental impacts, and the national health surveillance agency, the Anvisa, concerned with toxicology and human health issues. The Minister has since promised a system that would cut approval times by over two-thirds from a typical 24 month process to one taking 4-8 months.

The number of approvals has been declining steeply in the past few years. In each of the past five years, just 1-3 ais have been authorised. Approvals had been running at more than 20 per year a decade ago.

Peru has approved regulations covering the life cycle of pesticides that should significantly reduce pesticide approval times. Among the claimed benefits of the new rules in the regulation, DS No 00102015 Minagri, will be the consolidation in one regulation all the activities of the life cycle of a pesticide, such as import, manufacture, formulation, marketing, distribution, packaging, phytosanitary emergencies, monitoring and control of registered products.

In Brazil, the Anvisa board has approved the start of a re-evaluation process for glyphosate and four other ais: the herbicide, lactofen, the fungicide, thiram, the insecticide, carbofuran, and the acaricide/insecticide, abamectin. The agency launched a reassessment programme on 14 ais including the above five in 2008. It has since placed restrictions on several and implemented bans on the other pesticides, including on parathion-methyl and phorate insecticides last year. A federal court recently ordered the Anvisa to issue a conclusion on the other ais by the end of September following severe delays to the original programme. The agency is seeking public comments on the reassessments.
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The Ministry has further prioritised eight pests, weeds and diseases as key targets for pesticides in the approval process. Those include Asian soybean rust, earworms (*Helicoverpa armigera*), nematodes and the resistant weeds, horseweed (*Conyza bonariensis*) and sourgrass (*Digitaria insularis*).

A working group was formed under FMC co-ordination for the re-evaluation of carbendazim fungicide by the Anvisa last year. It sent notifications in September with requirements to registrants on the resumption of 2,4-D herbicide reassessments that began in 2006, while three-quarters of the companies contacted by Monsanto had signed up with Brazilian consultancy Planitox to defend glyphosate registrations under review.

The industry has this year requested an extension to the 30-day limit for analyses and registration on 2,4-D impurities. The request was made on behalf of the industry’s 2,4-D working group. It wants the requirement to be extended to 60 days as there is no available laboratory in Brazil to test for impurities and the required logistics in sending samples.

The Ministry has further prioritised eight pests, weeds and diseases as key targets for pesticides in the approval process.

In June, Colombia banned the aerial application of glyphosate in national parks where “illicit crops” are grown. Those are crops such as coca plants that may be used to produce narcotic drugs. The judiciary's national council has annulled a statute allowing the spraying of the herbicide that was used by the government to combat the harvesting of coca leaves. The ban has recently been overturned as controls had become ineffective.

The Ministry of Agriculture maintained that use of glyphosate would remain permitted on agricultural crops for which it has authorisation.

Brazil extended restrictions on four insecticides on cotton or winter crops within 300 m of cotton fields in the flowering stage early this year. They allow for aerial applications on cotton, which had been suspended, and last for one year. The imposed restrictions cover the neonicotinoids, imidacloprid, thiamethoxam and clothianidin, and the phenylpyrazole, fipronil, until the conclusion of the Ibama’s reassessment of the ais. The original restrictions included bans on aerial applications on several crops including cotton. The aerial application restrictions were lifted for soybean and cotton growers early in 2013.

Paraguayan authorities and the UN FAO launched a programme to lower the risks posed from “highly harmful” pesticides late last year. The work will run over two years, during which time: a report on the state of “highly toxic pesticides” and their economic impact will be obtained; a pilot risk reduction plan designed and implemented; and education and awareness of the risks disseminated.

**Earworms**

Growers and agrochemical suppliers are lobbying Brazilian authorities for details of which states are to be granted emamectin benzoate insecticide use extensions. The insecticide holds one-year emergency use approvals in some states for the control of earworms.

The pest is, however, coming under control. Earworms caused huge losses in Brazil two years ago and remain but are increasingly containable. Falling occurrence of the pest is due to actions of natural predators, and the employment of many biological control agents in large quantities. Emergency measures such as approvals of biological controls and of imports of emamectin benzoate have been adopted over the past two years.

Paraguayan authorities concluded late last year that IPM and the use of GAP constitute one of the better strategies for the control of the spread of earworms in Paraguay. They committed to replicating measures that had already been implemented in Brazil to control the spread of the pest.

The Argentine lower house of Parliament granted part sanction in 2014 to the draft law on agrochemicals. The house approval is for legislation that would guarantee free delivery of pesticides to grapevine growers to combat European grapevine moths (*Lobesia botrana*). The bill proposes guaranteeing applications through delivery of insecticides. The approval was also extended to a private members bill that seeks to ban the production, import and use of phosphine and another phosphorus-based compound with any type of pesticide in cereal and oilseed products or sub-products in transit. The issues move to the upper house, the Senate.

The government committed itself this year to seeking ways to accelerate the approval processes for the imports of agricultural inputs.

In Brazil, the Ibama has established inspection routines for the import of pesticides at Sao Paulo airport, while the industry and academic researchers have launched the BeeHive Viva Project in the same state. It seeks to identify the areas and causes of rising bee mortality in Sao Paulo.

**Outlook**

Early reports foresee a “positive” outlook for the 2015 Latin American market. However, a correction rather than growth is the consensus. That will be due to: the shift in planting in Brazil and Argentina; lower crop prices, drought and further uptake of genetically modified crops cannibalising sales of herbicides and insecticides in Brazil; and trade issues and inflation in Argentina. Domestic demand and an improving economic situation should sustain growth in less developed parts of the region.
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Zhejiang Beisi CropScience Co., Ltd.
No. 1, Fangjiada Road, Wuyuan Economic Development Zone, Yuyao, Zhejiang, China

Contact: Ms. Christina Wu  Email: christinawu@udragon.cn  Telephone: +86-571-8922066
Fax: +86-571-86229999  Website: www.udragon.cn
Latin America reaps a GMO harvest

Robert Birkett reviews a year of controversies and product developments in Latin America’s continuing adoption of GM agri-technology

Brazil solidified its position as the world’s second-largest grower of GM crops at 42.2 million ha on a 4.7% expansion in 2014. A similar increase is anticipated for the forthcoming season. Brazil accounted for almost a quarter (23%) of the global GM crop area, which was the same proportion as in 2013. GM crop plantings in Argentina were flat at 24.3 million ha, while Paraguay saw planting rise 8% to nearly 4 million ha.

The economic benefits from the cultivation of genetically modified crops in Brazil have exceeded $29 billion over 18 years since adoption of the technology to 2015.

BASF and the Brazilian agricultural research corporation, the Embrapa, have launched the first GM soybean line completely developed in Brazil. The imidazolinone herbicide-tolerant Cultivance (CV127) soybeans were co-developed by the companies. Biosafety authority approval came five years ago, a marketing deal was agreed in 2007, but demand for the product depended on EU import clearance. That arrived this year.

**Royalties**

In Argentina, Monsanto launched the final stage of its grower payment plan for use of its GM insect-resistant and herbicide-tolerant Intacta RR2 Pro (MON87701xMON89788) soybeans early this year. It would ensure that farmers were contracted to pay royalties for use of saved seed. The method consisted of a controlled collection of a “Canon Intacta” payment plan at grain delivery points during the year’s growing season in the north of the country. It allows for those who have not paid for seed in advance. However, the company anticipated that 70% of Intacta soybeans were to be supplied this year to growers who had signed up to pay in advance through the Canon Intacta system at $12 per 30 kg of seed.

Argentina’s Ministry of Agriculture subsequently issued a decree establishing a single payment rule for the use of GM crops. It will stop systems of royalty payments for the use of technology in saved seed derived from a GM crop. The Ministry is creating a registry in which growers record their second-generation seed to combat the market in illegal sale of saved GM soybean seeds. Farmers will have to declare how much of the seed they replant and how much they keep aside. The registry will allow the authorities to calculate the amount of available seed for use.

That followed farmer groups that had challenged the right of soybean exporters to inspect cargoes for illegal GM produce. Growers had agreed deals with Monsanto for inspections of soybean shipments to ensure that the company received royalties for use of its Intacta soybean technology. Some groups argued that only the state had the authority to inspect cargoes. They claimed that the forcing of payments was illegal and called on government to intervene and growers to stop signing agreements allowing the inspections.

Argentina approved Intacta soybeans in 2012. The passing of an intellectual property (IP) law has faced heavy resistance. The government has been planning to recognise IP rights for agricultural biotechnology products in a bid to tempt Monsanto into introducing its second-generation GM soybeans. It and Monsanto had previously been parties to long legal battles as far as in the EU over payment for royalties on earlier Monsanto technology.

Meanwhile, a Brazilian court has suspended an injunction that stopped royalty payments to Monsanto for cargoes of soybeans containing its Intacta RR2 Pro technology.

Meanwhile, the delay in the introduction of Brazil’s first developed GM feijao beans has cost some R$686 million ($226...
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The Brazilian biosafety authority is to expedite approval decisions on the sale and use of GM crop combination event products, for which the individual events already hold registrations. CTNBio Resolucao Normativa 15/2015 authorised the change to the body's rules.

**Approvals**

The Brazilian biosafety and GM crop authorisation authority, the CTNBio, has made some sporadic approvals over the past year. Two DuPont Pioneer GM maize products were approved earlier this year. They included its multi-stacked insect-resistant Optimum Leptra (DAS1507 + MON810 + MIR162) and its insect-resistant and herbicide-tolerant DAS1507 + MON810 + MIR162 + NK603 lines. The former controls various lepidopteran insect pests, while the second product adds the glyphosate herbicide-tolerant NK603 event to those for insect resistance of the first approval.

In August a Mexican court overturned an injunction that barred the authorities from approving the use of GM maize.

Then came the approval of Dow AgroSciences' herbicide-tolerant Enlist (DAS68416) soybeans. The technology confers tolerance to 2,4-D and glufosinate-ammonium herbicides. The commission also provisionally approved Enlist (DAS40278) maize. The biosafety commission further approved what would become the world's first GM eucalyptus. The product is engineered to increase wood production.

Authorisation for Monsanto's herbicide-tolerant Roundup Ready 2/LibertyLink (NK603xT25) maize came earlier in the year. The LibertyLink T25 event confers tolerance to glufosinate herbicide, while NK603 is tolerant to glyphosate. The product includes Bayer CropScience's LibertyLink maize event. Monsanto has a cross-licensing deal with Bayer covering use of Bayer's herbicide tolerance technologies.

In September last year, Brazil provisionally authorised the sale and use of Syngenta’s stacked insect-resistant and herbicide-tolerant Viprella 3111 (Bt11xMIR162xMR604xGA21) maize. Each of the four events had also been approved individually with the CTNBio decision. The triple-stacked Viprella 3110 containing all but MIR604 was approved in 2011. The MIR604 event comprises a modified cry3Aa (mcry3A) gene derived from Bt subsp. *tenerebrinis*.

Argentina has granted a lone approval this year. That was for Dow’s herbicide-tolerant Enlist E3 (DAS44406) soybeans. They are tolerant to the herbicides, 2,4-D, glyphosate and glufosinate-ammonium. The technology becomes the country’s sixth approved GM soybean line for sale and use and its first for Dow.

Paraguay has recently approved six GM maize lines this year. The authorisations bring the country’s range of commercially authorised GM products to 20, including 14 for maize, and three each for cotton and soybeans.

In Colombia, researchers from the Colombian Corporación para Investigaciones Biológicas (CIB – Medellin) claim that a GM insect-resistant potato will become available to the country’s growers pending registration within three years. The potato is resistant to Guatemala potato tuber moths (*Tecia solanivora Povolny*). The Colombia-based International centre for tropical agriculture, the Ciat, is carrying out research on GM rice and sugar cane, the Colombian university, the Universidad Nacional, is seeking to develop GM maize, rice and potatoes. But the most progressed product is the CIB’s GM potato, which has reached the limited field trial stage. Additionally, more Colombian regions are interested in approving the use of GM crops, following use of the technology by two further departments last year.

The Peruvian Ministry of Agriculture’s national institute of agricultural innovation, the INIA, has recommended a softening of the policy on the presence of GMOs in produce. It calls for a 2% threshold in the adventitious presence to be permitted on imported produce “in order to avoid a supply deficit” in the country. Peru issued a ten-year moratorium on the import and production of GMOs in 2012. The recent appointment of Dr Luis de Stefano as director of the INIA had led to expectations of a policy reversal on GM crops. Dr de Stefano is an advocate of their use.

Finally, in August a Mexican court overturned an injunction that barred the authorities from approving the use of GM maize. Two years ago, a Mexican judge ordered the Ministries of Agriculture and of the Environment not to grant further authorisations for trials, pilot planting and commercialisation of GM maize. The latest ruling follows findings that the suspension order contravened the application of biosafety legislation, and that evidence of damage from GM maize cultivation was lacking.

The ruling allows the Ministries of Agriculture, the Sagarpa, and of the Environment, the Semarnat, to reintiate processes towards the potential commercial approval of GM maize. Several pilot planting licences had been granted in the two years prior to the injunction. Pilot trials are an intermediate stage between field trials and full commercialisation, and are authorised over large areas.
### Key Products

<table>
<thead>
<tr>
<th>INSECTICIDE</th>
<th>FUNGICIDE</th>
<th>HERBICIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABAMECTIN</td>
<td>CARBENDAZIM</td>
<td>ACETOCHLOR</td>
</tr>
<tr>
<td>ACEPHATE</td>
<td>CHLOROTHALONIL</td>
<td>ATRAZINE</td>
</tr>
<tr>
<td>ACETAMIPRIDE</td>
<td>CYPRODINIL</td>
<td>BISPYRIBAC-SODIUM</td>
</tr>
<tr>
<td>CHLOROPYRIFOS</td>
<td>DIFENOCONAZOLE</td>
<td>BROMACIL</td>
</tr>
<tr>
<td>DIAFEN thiuron</td>
<td>EPOXICONAZOLE</td>
<td>MESOTRIONE</td>
</tr>
<tr>
<td>DIAZINON</td>
<td>FLUTRIAFOL</td>
<td>CLETHODIM</td>
</tr>
<tr>
<td>DIFlUBENZURON</td>
<td>MANCOZEB</td>
<td>CLODINA FOP-PROPARGYL</td>
</tr>
<tr>
<td>EMAMECTIN BENZOATE</td>
<td>PENCONAZOLE</td>
<td>CLOPYRALID</td>
</tr>
<tr>
<td>INDOXACARB</td>
<td>PROPICONAZOLE</td>
<td>CYHALOFOP-BUTYL</td>
</tr>
<tr>
<td>FENAZAQUNIN</td>
<td>PYRIMETHANIL</td>
<td>FLUOROCHLORIDONE</td>
</tr>
<tr>
<td>IMIDACLOPRID</td>
<td>TEBUCONAZOLE</td>
<td>GLYPHOSATE</td>
</tr>
<tr>
<td>METHOMYTH</td>
<td>TETRACONAZOLE</td>
<td>METribuzin</td>
</tr>
<tr>
<td>LUFENURON</td>
<td>TRITICONAZOLE</td>
<td>OXASULFURON</td>
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<td>TEFLUBENZURON</td>
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<td>OXYFLUORFEN</td>
</tr>
<tr>
<td></td>
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<td>PARAQUAT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PYRITHIOBAC-SODIUM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>QUZALOFOP-P-ETHYL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FLORASULAM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PROPAQUIZAFOP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PYRIDALE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SUL-FENTRAZONE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FLUMIOXAZIN</td>
</tr>
</tbody>
</table>

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Latin American market data 2014-15

Latin American markets in 2013/14 again recorded the strongest growth of any region in dollar terms, but at a slower rate than in 2012/13. The region also became the world’s principal crop protection market, rising by some 15.1% to $16,147 million, led by growth in Brazil and Argentina.

The 2013/14 market started with a shift in planting from maize to soybeans following the excellent US harvest and lower crop prices. A dry start to 2014 resulted in lower Asian soybean rust (*Phakopsora pachyrhizi*) pressure. That, along with a reduced sugar cane harvest and low crop prices, held back growth of the Brazilian market. Despite trade restrictions on crops and agrochemicals, the devaluation of the peso and high inflation, the Argentine market performed well as it benefited from better weather.

The 2014/15 season again got off to a good start, although low maize prices affected planted acreages. Agrochemical market growth in “developing” Latin America was sustained.

<table>
<thead>
<tr>
<th>Region</th>
<th>2013</th>
<th>% change</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latin America</td>
<td>14,026</td>
<td>+15.1</td>
<td>16,147</td>
</tr>
<tr>
<td>Asia</td>
<td>14,432</td>
<td>+1.5</td>
<td>14,644</td>
</tr>
<tr>
<td>Europe</td>
<td>13,634</td>
<td>+1.8</td>
<td>13,885</td>
</tr>
<tr>
<td>NAFTA</td>
<td>10,011</td>
<td>-2.0</td>
<td>9,810</td>
</tr>
<tr>
<td>Rest of the world</td>
<td>2,105</td>
<td>+3.1</td>
<td>2,169</td>
</tr>
<tr>
<td>Total</td>
<td>54,208</td>
<td>+4.5</td>
<td>56,655</td>
</tr>
</tbody>
</table>

Source: Phillips McDougall

### Brazilian agrochemical market ($ million)

<table>
<thead>
<tr>
<th>Product category</th>
<th>2013</th>
<th>% change</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insecticides</td>
<td>4,554</td>
<td>+7.4</td>
<td>4,892</td>
</tr>
<tr>
<td>Herbicides</td>
<td>3,739</td>
<td>+4.4</td>
<td>3,902</td>
</tr>
<tr>
<td>Fungicides</td>
<td>2,592</td>
<td>+12.1</td>
<td>2,907</td>
</tr>
<tr>
<td>Others</td>
<td>569</td>
<td>-4.0</td>
<td>546</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11,454</strong></td>
<td><strong>+6.9</strong></td>
<td><strong>12,249</strong></td>
</tr>
</tbody>
</table>

Source: The Sindiveg

The country’s agrochemical sales suffered a drop of a quarter in the first half of 2015, according to the Sindiveg. The association cites high temperatures and a prolonged drought leading to lower pest pressure, the high cost of the US dollar/Brazilian real exchange rate and high stock levels in the supply chain. That put the size of the market for the six-month period at some $2,700 million, the generic pesticide industry association, the Aenda, reports. The Sindiveg anticipates full-year sales to have fallen by 15% to $10,300 million.

### Argentina

The Argentine agrochemical market rose by 9% to $2,739 million in 2014. The reported market experienced rising weed resistance to herbicides such as glyphosate as driving growth in applications and sales. Half of the agricultural area that has weed problems presents resistance to glyphosate.

<table>
<thead>
<tr>
<th>Segment</th>
<th>2013</th>
<th>% change</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herbicides</td>
<td>1,808</td>
<td>+7.7</td>
<td>1,948</td>
</tr>
<tr>
<td>Insecticides</td>
<td>343</td>
<td>+16.6</td>
<td>400</td>
</tr>
<tr>
<td>Fungicides</td>
<td>197</td>
<td>+25.4</td>
<td>247</td>
</tr>
<tr>
<td>Seed treatments</td>
<td>102</td>
<td>-14.7</td>
<td>87</td>
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<tr>
<td>Others</td>
<td>55</td>
<td>+3.6</td>
<td>57</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,506</strong></td>
<td><strong>+9.3</strong></td>
<td><strong>2,739</strong></td>
</tr>
</tbody>
</table>

* may not add up due to rounding; Source: via El Clarin newspaper

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**Latin American Supplement 2015**

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Growing the business of CROs and evolving regulatory requirements – Smithers Viscient’s recent expansion aids its testing capabilities

Staying on top of changes in regulatory requirements and new test designs is critical and CRO, Smithers Viscient, continues to respond to industry needs, offering clients the latest and best testing capabilities. This has included the move of its European testing facility to brand new, purpose built premises in North Yorkshire, United Kingdom.

The Challenges

For R&D divisions staying on top of these changes and their consequential regulatory impact is critical. For Smithers Viscient’s UK based business being able to drive client projects by continuing to adapt and respond to these changes is key to its clients’ success.

Commented Smithers Viscient’s MD David Phillips: “The industry continues to face challenges with new active substances and product reregistration’s under regulation (EC) 1107/2009. New data requirements and emerging areas of environmental concern only add to making the process more complicated. With continuing demand in ecotoxicology and environmental fate testing needs our clients are requiring higher quality and more detailed testing delivered on scientifically challenging briefs. Our new facilities have allowed us to design and build a research laboratory that can offer our clients everything they will need to meet these needs, now and for the foreseeable future.

“This facility couples with our expertise to allow us to keep our clients ahead of challenging regulations and requirements globally.”

New Laboratory

In Q4, 2014 Smithers Viscient celebrated its new laboratory with a gala lunch for clients, industry, academia, Government representatives and locals. The laboratory was officially opened by the Major and Mayoress of the Borough of Harrogate and CEO of The Smithers Group, Michael Hochschwender.

Continued Phillips: “Our priorities were to provide first class facilities for our clients and retain our talented scientists. The majority of staff live locally (to Harrogate) and so we had to keep this in mind. Naturally we wanted to ensure good local transportation networks and access for clients and employees alike. All of which has been achieved.”

Part of the CRO’s increased capabilities is due to new equipment like the mass spectrometry suite, which has expanded the CRO’s quantitative and qualitative analytical capabilities. These investments have also been fundamental in addressing an increase in demand for...
Cold environmental fate work in addition to broadening other chemistry offerings, such as 5 BATCH analysis.

In fact, the new facility and its staff have opened up additional avenues for Smithers Viscient that fall outside markets it has traditionally served. In 2015 the CRO will broaden this scope through their growth program – so watch this space.

**Regulatory Help**

Governmental regulations pertaining to the management of chemicals continue to broaden globally as existing legislation is updated and new regulations are adopted that are designed to minimise the risks to human health and the environment. In addition to companies that manufacture, store, and/or transport chemicals affected by these regulations, users of chemicals must meet requirements for proper management of these materials, and labelling and packaging of any products containing them.

**Discussing the new regulations, Phillips said:** “We are seeing many clients preparing well in advance for their registration deadlines because they know that action needs to be taken and scientific challenges overcome quickly in order to guarantee successful and timely registrations. Companies that have embraced the legislation and data compliance issues will naturally have a significant advantage over their competitors.”

“Endocrine Disruption and risks to Honey Bees will still be key issues in 2015 and we will continue to monitor this in Europe.

Scientific expertise that can be relied upon will continue to be vitally important for R&D companies that need trust in project delivery; pressures from new guidelines and data requirements will make this even more of a factor in choosing a CRO than ever before.”

**Trust & Reputation**

Smithers Viscient’s key strengths are that it can address technically challenging compounds and substances, while also delivering work on time and on budget. Its brand has been built on trust and in fact, along with the integrity of the science the CRO delivers, confidentiality and trust are foundational elements of Smithers Viscient’s business values.

Continued Phillips: “We realise the importance of our test results and the impact they have on our clients’ success. Our philosophy is to provide innovative scientific solutions that add value to our clients’ respective registrations.”

2015 will also see more work from French R&D companies as Smithers Viscient received CIR approval from the French Ministry of Higher Education and Research (La Ministère de L’Education nationale de l’Enseignement supérieur et de la Recherche, MENESR) for 2014 to the end of 2016.

Smithers Viscient, has been helping clients since 1969 and is proud to be an independent CRO. The CRO provides a full service laboratory, specialising in environmental and consumer safety contract research and regulatory services for the crop protection industry. With operations in North America, Japan and Europe, the CRO has serviced thousands of clients across the world providing acute to chronic and life cycle testing.

Smithers Viscient is a stable company that is well positioned in the market to serve its clients well into the future.

If you are interested in a site tour or would like more information, please contact Fiona Brook-Rogers, Marketing & PR Manager Europe +44 (0) 1423 532 710 E: info@smithersviscient.com

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### HERBICIDES

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Herbicide</th>
<th>Herbicide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flumioxazin</td>
<td>Butroxydim</td>
<td>2,4-D, 2,4-DB, 2,4-DP-p</td>
</tr>
<tr>
<td>Diclosulam</td>
<td>Cloransulam</td>
<td>MCPA, MCPB, MCPP-p</td>
</tr>
<tr>
<td>Flumetsulam</td>
<td>Florasulam</td>
<td>Glyphosate</td>
</tr>
<tr>
<td>Isoxaflutole</td>
<td>Mesotrione</td>
<td>Dicamba</td>
</tr>
<tr>
<td>Foramsulfuron</td>
<td>Fluridone</td>
<td>Atrazine</td>
</tr>
<tr>
<td>Sulfentrazone</td>
<td>Carfentrazone</td>
<td>Terbutryn</td>
</tr>
<tr>
<td>Propyzamide</td>
<td>Tebuthiuron</td>
<td>Diuron</td>
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<td>Imazethapyr</td>
<td>Imazapic</td>
<td>Bromacil</td>
</tr>
<tr>
<td>Imazamox</td>
<td>Imazapir</td>
<td>Tebuthiuron</td>
</tr>
<tr>
<td>S-Metolachlor</td>
<td>Metolachlor</td>
<td>Propanil</td>
</tr>
<tr>
<td>Acethlor</td>
<td>Butachlor</td>
<td>Clomazone</td>
</tr>
<tr>
<td>Haloxyfop</td>
<td>Quizalofop</td>
<td>Picloram</td>
</tr>
<tr>
<td>Fomesafen</td>
<td>Oxyfluorfen</td>
<td>Triclpyr</td>
</tr>
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### FUNGICIDES

<table>
<thead>
<tr>
<th>Fungicide</th>
<th>Fungicide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyraclostrobin</td>
<td>Picoxystrobin</td>
</tr>
<tr>
<td>Azoxystrobin</td>
<td>Trifloxystrobin</td>
</tr>
<tr>
<td>Cyprodinil</td>
<td>Fludioxonil</td>
</tr>
<tr>
<td>Fluazinam</td>
<td>Boscadil</td>
</tr>
<tr>
<td>Prothioconazole</td>
<td>Metconazole</td>
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<tr>
<td>Cyproconazole</td>
<td>Epoxiconazole</td>
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<tr>
<td>Tebuconazole</td>
<td>Hexaconazole</td>
</tr>
<tr>
<td>Propiconazole</td>
<td>Difenconazole</td>
</tr>
<tr>
<td>Pyrimethanil</td>
<td>Isoprothiolane</td>
</tr>
<tr>
<td>Captan</td>
<td>Chlorothalonil</td>
</tr>
<tr>
<td>Carbendazim</td>
<td>Benomyl</td>
</tr>
<tr>
<td>Mancozeb</td>
<td>Propineb</td>
</tr>
<tr>
<td>Dimethomorph</td>
<td>Tridemorph</td>
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</table>

### INSECTICIDES

<table>
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<th>Insecticide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spiroxamine</td>
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<td>Imidacloprid</td>
</tr>
<tr>
<td>Chlorfenapyr</td>
<td>Methoxyfenozide</td>
<td>Chlorpyrifos</td>
</tr>
<tr>
<td>Dinotefuran</td>
<td>Pymetrozine</td>
<td>Lufenuron</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lambda-cyhalothrin</td>
<td>Thiamethoxam</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Emamectin</td>
</tr>
</tbody>
</table>

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We recently reported that a federal judge had ordered the national health surveillance agency, the Anvisa, to complete its reassessments of the remaining active ingredients in its 14 pesticides review. What is happening? Is this legal order being contested?

Silvia Sagnani: There are six remaining pesticide active ingredients to be assessed in the review. The programme started in 2008 with 120 days set for its completion, which was impossible. Only eight were completed by last year. In 2014, a federal judge ordered that the assessments be completed within 180 days or the products’ sales be suspended.

[the six remaining ais in the review include: the herbicides, glyphosate, lactofen and paraquat; the fungicide, thiram; the insecticide, carbofuran; and the acaricide/insecticide, abamectin]

SS: Sindiveg made a presentation at the court. We said: “180 days would be impossible and they should not suspend products as there no reason to do so”. Then this year, another judge ordered the reassessments be concluded within 90 days (by September 23rd), but said nothing about [right to] sales.

We have requested a longer term to the deadline, but have not yet received a response. The Anvisa has also requested this. It is impossible to complete in less than six months. I believe the courts will be reasonable [and allow an extension] as there are lots of technical materials to assess.

Jose Perdomo: We respect sovereign government issues and their requirements, and support all reviews especially when they are based on a risk/benefit analysis, which is how they are developed. There has been years of turmoil in the Brazilian agency, and there has not been enough work in synchrony. Brazil has a highly complex system for approving agrochemicals, among the most bureaucratic, involving three agencies: the Ministry of Agriculture, the Anvisa and the environmental agency, the Ibama. And new chemicals are not reaching the market as a result.

There is a large backlog [of pesticide assessments] at the Anvisa, and the [court’s] timeframe is unlikely [to be met]. I do not expect within a month’s time that any assessments will be concluded. I believe there'll be an extension.

SS: The Anvisa last month initiated – only initiated – the reviews on the remaining six ais.

Why have these assessments taken so long?

SS: The Anvisa is deeply bureaucratic, there are too few people conducting the assessments. Also, they should never have implemented a programme with 14 ais at the same time. If they had done the reassessment one by one, they would not have had these problematic delays, and could have terminated the programme by now.

Media reports claim that the Anvisa is suffering from internal disputes due to problems with pesticide regulatory concerns. The Anvisa’s manager of toxicology has been exonerated of mismanagement according to various reports. What has happened?

SS: Ms Vekic has left the Anvisa as of yesterday (September 2nd). There was a very large list of problems. The major concerns were the delays in the reassessment programme, the court verdicts on the matter. As the manager, she was responsible.

Another reported factor is a scandal involving the publication of secret compositions of 11 pesticides. What has happened and what is being done about it?

SS: Brazil legislated last year for more transparency with information from government. Documents were being uploaded onto an online Ministry of Agriculture resource, Agrofit. But trainees employed to do the job uploaded the wrong documents and the secret information on 11 pesticides was issued. The system has been ended, and the data are no longer publicly accessible.

Are other countries in Latin America facing legal or regulatory challenges to the sales and use of glyphosate?

JP: Glyphosate has not been a regulatory issue, but has been a controversial one, especially in Argentina. However, the national government has been very supportive. This year, it has declared its support for its regulatory agencies and of the use of a registered product like glyphosate.

However, in Colombia the well-trailed UN assessment led to
Sichuan Leshan Fuhua Tongda Agro-Chemical Technology Co. Ltd. specializes in glyphosate manufacturing, with current annual Glyphosate 95% Tech production capacity of 120,000MT (glycine route). It is the largest producer in China and the second largest worldwide. Fuhua is projecting an increase in capacity of 120,000MT/a in the next three years by fully utilizing the advantages of its integrated industrial production chain involving phosphorus, brine, glyphosate and silicone, making it to be the most competitive glyphosate producer in the field. The factory is located in Leshan city, Sichuan Province, an area with extensive resources for glyphosate manufacturing, and the international sales offices are located in Shanghai and Singapore. Fuhua exports glyphosate to America, Asia, Africa, Oceania and Europe, with over 2500 employees around the world.

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- GLUCOSINATE 65% TECH
- DICAMBA 88% TECH
- ACETOLINIR 65% TECH
- BENTAZONE 98% TECH
- IMIDACLOPRID 95% TECH
- MESOTRONE 97.5% TECH
- PROPEMPO 84% TECH
- PYRIMIDONE 95% TECH
- ACETOPAMIDE 95% TECH
- GLYPHOSATE 84% IPA SALT
- GLYPHOSATE 41% SL
- Z 4 D 95% TECH
- PYRAZOTOSTROIN 93% TECH
- FLUOXYPYR ISOGOTYL ESTER 85% TECH

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- CAUSTIC SODA PEARLS / SOLIDS
- SODIUM TRIPOLYPHOSPHATE (STPP)
- GLYCOLE (INDUSTRIAL GRADE)
- GLYCOLE (FOOD GRADE)
- PARAFORMALDEHYDE
- AMMONIUM CHLORIDE
- MELAMINE 36.6%
- METHYLINE
- HEMAMINE
- SODA ASH
- TRIPLE SUPERPHOSPHATE
- DAP
- NPK
- MAP
- UREA

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Fax: +86-21-61000477 (Agrochemical)
+86-21-58310166 ext 811 (Chemical)
Email: info@fuhua-tongda.com
a ban of use of the herbicide on illicit crops. [Colombia has banned the aerial application of glyphosate herbicides in national parks where “illicit crops” are grown] The ban did not cover any other registered uses. Only one or two weeks ago, the government went back on its decision and re-allowed that use of the herbicide.

We face challenges from well-financed organisations that campaign against pesticide use. At the start of the year, in Venezuela placed restrictions and bans on insecticides of category 1A and 1B. There were rumours that the move was the result of intense lobbying. Whether that was due to such lobbying I do not know. In any case, the impact on agriculture became apparent to government following reactive lobbying from farmers. In a little over a month, the government decided to launch a review of the policy and how the products could be applied under a proper use regime. But the industry is concerned about potential impact of such lobbying.

What are the key impediments or obstacles to growers’ demand for agrochemicals currently? Farmers face falling crop produce prices on international markets and the falling exchange rate of the Brazilian real to the US dollar. That raises prices farmers’ income. I understand that credit is more restricted or more expensive than in previous years. Which impact is strongest?

SS: The major problem has been the fall in the value of the Brazilian real against the dollar. Of the 25% fall in sales in the first half of this year, one half was due to the devaluation. The other major concerns included lower infestation levels and destocking of products bought last year.

JP: Those are most of the major problems. For export countries, the fall in crop prices has had a major impact on what farmers can earn, and the exchange rates have seen severe falls. In Colombia, the value of the national currency is down 30% against the dollar in a year. Argentina and Mexico have seen falls, the latter has the peso down from 13 peso to the dollar to 17.

But a major impact has come from the weather this year. The effects of El Niño this year have brought incredibly dry weather to Mexico and the Central America region, including the Caribbean. Farmers were unable to grow their crops. Severe weather has impacted Brazil and to some extent Argentina. All these issues are compounding the other causes of falling demand. I would put weather impacts as the second major obstacle to demand in 2015 after the exchange rates. They would be followed in a ranking of causes of falling demand by lower commodity prices.

What is the agrochemical industry doing to counter the potential reduction in demand, and what success is it having?

SS: We do not see any concerted policy.

JP: We do not get involved at CropLife in these issues. But companies will need to be very creative in supporting farmers, where there is low credit availability, reduced crop prices and complicated weather. I would expect a lot of bartering deals to go around. Even though the Latin American region grew agrochemical sales the most last year compared with other global regions, I think at 10%, this year will be different, perhaps with minor growth. I still expect some growth, despite the increased risks. But companies are seeking innovative ways to help farmers understand analyses of weather, crop prices and the like and perhaps by the end of the year we will know about novel methods of boosting demand.

What is happening with pest and disease pressures? Does soybean rust _Phakopsora pachyrhizi_ continue to be a major disease?

SS: Rust remains a major concern for growers, and one for which fungicide suppliers have robust business. Our recent study of first half agrochemical sales saw big falls in herbicide and insecticide sales, but fungicide business was stable. So we expect this to continue.

Reports indicate that earworms (_Helicoverpa spp_) infestation levels are much reduced this year? How has that happened?

SS: One reason is lower infestation levels due to the weather. Also, more solutions are coming onto the market. When earworms were first being detected coincided with [a time when] the vanishing from the market of many products. There were no pesticides to deal with Helicoverpa, but now there are several. So it has become controlled. Partly the fall in incidence is due to the dry weather; part is due to the availability of products.

JP: Brazil has suffered tremendous losses from Helicoverpa in the past couple of years, but that the pressure from the pest is under much better control. Farmers understand cycles far better and use of IPM, while agricultural research corporation, the Embrapa, and university researchers have improved knowledge of how to combat the pest.

In Central America we have coffee rust (_Hemileia vastatrix_) hitting crops for several years. Around 40% of the crop from southern Mexico down to Peru is still affected, while rust-resistant varieties have been developed. And with coffee prices where they are now, means investment in technologies has been prudent. But we have better understanding of rust management among growers and with the dry weather bringing some positive effects, the outbreaks are less severe this year.

Then we have had severe losses in some countries from fruit flies. However, we anticipate from the results of actions taken such as the use of pheromones and mass laying of traps in the
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Dominican Republic that the problem will be eliminated there by the end of the year.

Overall, there are reduced pressures from diseases and pests this year in the continent.

What are the most significant emerging pest pressures and how severe are they?

SS: There are eight principal pests, weeds and diseases. They include: Asian soybean rust (Phakopsora pachyrhizi) on soybeans; white mould (Sclerotinia sclerotiorum) on cotton, feijao beans and soybeans; earworms (Helicoverpa armigera); whiteflies (Bemisia tabaci) on feijao beans, melons, tomatoes and soybeans; nematodes (Meloidogyne javanica, Mincognita, Heteroderca glycines and Pratylenchus brachyurus) on soybeans; coffee borer beetles (Hypothenemus hampei); the resistant weeds, horseweed (Conyza bonariensis) and sourgrass (Digitaria insularis) on cotton, feijao beans and soybeans; and boll weevils (Anthonomus grandis) on cotton.

These are long term pests and there are no new significant pests to report.

The new Agriculture Minister Katia Abreu announced a policy priority to streamline and expedite agrochemical product approval processes. What ideas are coming from the Ministry?

SS: A major policy that is likely to be adopted is the removal of many products from the process, because the same pesticide with a different brand has already been approved. The applications are a waste and their removal would remove 40% of the number of applications from the queue.

There are many other measures being considered. We have submitted six suggestions, but the one on same product but different brand is the most significant.

The six include: RET (special temporary registration), allowing experimental use of new products not yet approved in Brazil; REX (export registration) only for unapproved products in Brazil for export; the creation of a positive list of components that could be used without prior authorisation; packaging – creation of positive packaging list, validated by the inpEV [the Brazilian recycling organisation] that could be done in Europe. Rather than repeat such evaluations that have been carried out say in the US, why not simply carry out local efficacy evaluations of the product, while using data already complied in those other countries? They could test modifications to local conditions. Probably these are the sorts of ideas being contemplated.

We are talking about a country that has only approved five new chemicals in the past five years.

I would also cite Mexico. The Mexican authorities, probably because of US influence [the country is within the trading bloc and regulatory platform of NAFTA with the US and Canada] is renewing its processes in the most progressive fashion. It is not at the vanguard, for example, it grants five years protection on intellectual property while many in Latin America give ten years. But Mexico is showing promise with its regulatory developments.

Do those ideas and the policy require the support of other agencies (notably Anvisa, Ibama), and have they (Anvisa, Ibama) made any comments on the issue? What are the industry’s hopes…and expectations?

SS: The Anvisa and Ibama are being very supportive of the Minister of Agriculture on this issue. We expect some proposals to be adopted by the end of the year and are particularly hopeful of those involving same products but different brands.

Are pesticide sales so far (to date this year) reaching expectations? How have sales met or exceeded expectations in the past 2-3 years? And why?

SS: We do not expect sales to fall so strongly in the second half. We still have the problem of the lower exchange rate, but we not have the concern with growers using up stocks, as inventories are way down. Over the year, we expect the market to have fallen some 15% to $10.3 billion.

We do not know how long this will last, but Brazil’s economic crisis is forecast to last until mid-2017 [and that could keep the real’s value low]. However, we expect agricultural production levels to remain where they are and for exports to continue.

JP: We still expect continent-wide growth, but much reduced.

Brazil has one of the most complex systems. It has the regulations of the first world, but the bureaucracy of the third. Brazil has attempted to mirror the regulatory regimes of Europe and the US, but those have more resources, experience and capabilities to deliver on those regulations.

In Brazil and the rest of Latin America, we are limited by our capabilities and lack of resources. Latin American authorities often do not have the capabilities to carry out full-scale evaluations that can be done in Europe. Rather than repeat such evaluations that have been carried out say in the US, why not simply carry out local efficacy evaluations of the product, while using data already complied in those other countries? They could test modifications to local conditions. Probably these are the sorts of ideas being contemplated.

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JP: We still expect continent-wide growth, but much reduced.
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Brazil prioritises targets for agchem approvals

The Brazilian Ministry of Agriculture has prioritised eight pests, weeds and diseases as key targets for pesticides in the approval process. The Ministry has listed them in the official gazette as representing “greatest risk to the health of the major Brazilian crops”. The gazette reads: “They are considered the pests of greatest risk to crops of economic importance, requiring priority profiling in the registration of products for their control.”

Those eight pests, weeds and diseases and their crop combinations include: Asian soybean rust (*Phakopsora pachyrhizi*) on soybeans; white mould (*Sclerotinia sclerotiorum*) on cotton, feijao beans and soybeans; earworms (*Helicoverpa armigera*) on cotton, maize and soybeans; whiteflies (*Bemisia tabaci*) on feijao beans, melons, tomatoes and soybeans; nematodes (*Meloidogyne javanica, Mincognita, Heterodera glycines* and *Pratylenchus brachyurus*) on soybeans; coffee borer beetles (*Hypothenemus hampei*); the resistant weeds, horseweed (*Conyza bonariensis*) and sourgrass (*Digitaria insularis*) on cotton, feijao beans and soybeans; and boll weevils (*Anthonomus grandis*) on cotton.

Companies that already possess the requirements of the regulation are to submit a list within five days of the publication containing various data. They include the registration process number, trade mark, active ingredient(s) and indication of target pest.

Brazilian agchem sales crash in first half

Brazilian agrochemical sales dropped by a quarter in the first half of 2015, according to the agrochemical industry trade association, the Sindiveg. The association cites high temperatures and a prolonged drought leading to lower pest pressure, the high cost of the US dollar/Brazilian real exchange rate and high stock levels in the supply chain.

Sindiveg vice-president Silvia Fagnani notes the falling need for products as impacting demand. “Without the need to make applications in the field, growers do not invest in technology and those in the supply chain do not restock,” he says. “The difficulties in accessing credit continue to stifle farmers who bide their time for the right moment to buy,” he adds.

The outlook for the rest of the year includes a recovery based on delayed purchases, but an overall drop in annual sales. The Sindiveg had anticipated 2015 sales to be flat or slightly rising. The market reached some $12 billion last year. “We consider 2015 to be a year of correction in sales,” Mr Fagnani notes.
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Latin America pioneers and disseminates innovative stewardship

From the vanguard of pesticide container disposal and recycling to training illiterate smallholders in proper use of pesticides, Latin America boasts records and faces stark challenges in stewardship.

The region’s crop protection industry association, CropLife Latin America, runs two main programmes in the region, among 25 associations in 18 countries.

Campo Limpio (Clean Field) covers the recycling activities of the associations. Last year, the region’s Campo Limpio programmes collected and recycled some 54,288 tonnes of plastic empty pesticide containers through its associations. That amounted to an 8% rise on the previous year at a cost of $32.5 million.

The greatest success in stewardship has come from Brazil. The recycling organisation, the inpEV, has “become the poster child” worldwide, CropLife Latin America’s president, Jose Perdomo, says. “It is achieving 95% collections of all the plastic used in the fields due to agrochemicals, and recycling a large part of that into new containers. That is far above what others achieve. Guatemala also collects the majority of its waste at 57%, Argentina is a lower number, and in smaller countries, you have perhaps just 5-30%.”

Brazil recycled 42,646 tonnes in 2014, up some 5.5% on the previous year. It has a legal requirement on all in the supply chain to be responsible for the waste in the field, from manufacturer to user, Mr Perdomo told Agrow.

Brazil has been working on the collection and recycling of containers since the early 1990s. It was a voluntary initiative of the pesticide industry, and pilot projects soon led to legislation in the decade. The law grants responsibility for recycling right across the business chain.

The inpEV’s Campo Limpo Reciclagem organisation set up in 2008 pioneered the recycling of used containers into new pesticide containers in the past few years. The new pesticide containers are manufactured with three layers, with the recycled element sandwiched between two virgin layers.

In most Latin American countries, the recycling is only voluntary, Mr Perdomo notes. Colombia passed legislation in 2007 (Resolución 693), and further regulations in 2013. It demands annual growth in collections of at least 5%. The national sector’s goal is to reach 80% collection of used materials “over a time period”.

Furthermore, Argentina is developing its own legislation to enforce a system involving all in the supply chain, as with Brazil, he adds. That law should be issued “as early as next year”. CropLife is offering advice on potential rules.

“We also have the aim of realising 5% growth in collections across the region per year, and in most countries we are achieving that.”

CuidAgro

The second programme is CuidAgro, which focuses on education on best practice IPM and the use of agrochemicals as a last resort. This is tailored mainly towards small-scale farmers, characteristics of whom often include illiteracy or the speaking of local non-Hispanic languages, such as Mayan in Central America. Training is typically carried out in their own languages, or bilingually. The work is predominantly in Mexico, Central America and the northern parts of South America.

“Reaching such people presents the greatest potential for increased productivity through good use of these [pesticide] products and employing best practice.” Mr Perdomo notes. “Cuidagro teaches teachers as that creates a multiplier effect of reaching more people.”

The association trained over 200,000 people last year, more than a third up on 2013. The association invested $1.9 million in the venture. Associate companies reach many more, but figures are not available.

Huertos Escolares

Mr Perdomo cites the case of Guatemala for locally developed initiatives. “There is a programme in Guatemala known as ‘Huertos Escolares’ [school gardens].” National and local associations train school children either directly or indirectly through the training of school teachers how to develop a plot of land. “It is to help children who will often become farmers to understand the value of producing food sustainably,” the CropLife leader explains. “We go to rural schools and train in issues such as soil, water, chemicals and the use of technology and managing the ecology.”

Guatemalan associations have designed a “biological bed” to counter the presence of pesticide residues in the soil, and surface and subterranean water. The national association, the Camagro, cites its previous use in “various European countries”. It is largely composed of plant substrata containing rice, maize or sorghum straw. White rot (Phanerochaete chrysosporium) and the enzyme system destroys the straw substrata and many of the chemicals, including pesticides. Under normal conditions, any pesticide spill in the bed would degrade before reaching the water table.
CropLife is seeking to extend the stewardship message beyond mainstream agricultural areas. “Some of our work involves moving into the jungle to teach the use of technology, especially of chemicals, and for this we seek alliances.

CropLife Latin America last year joined GlobalGap aimed at strengthening the promotion of sustainable agriculture in the region, through training in GAP and compliance with certification requirements. The association views the move as supporting its CuidAgro programme.

In the Southern Cone region, national associations such as the Casafe in Argentina, Afipa (Chile), Camagro (Uruguay) and Cafyf (Paraguay) have designed a five-year plan running to 2020 in supporting farmers, communications, regulations and scientific affairs.

Brazillian court suspends Intacta injunction

A Brazilian court has suspended an injunction that stopped royalty payments to Monsanto for cargoes of soybeans containing its genetically modified insect-resistant and herbicide-tolerant Intacta RR2 Pro (MON87701xMON89788) technology. The Rio Grande do Sul state Tribunal of Justice decision makes the charging of royalties legal. The 16th Civil Court of Porto Alegre District had prohibited in the first instance the collection of 7.5% royalty payments on cargoes of the soybeans. That followed a class action involving several grower and rural workers’ unions.

Monsanto reportedly asserts that its royalty payment system is operating across Brazil with testing and collection of payments at point of sale of grain. Some growers use certified seed having already paid a royalty fee, and are not charged at the point of sale. The company adds that Intacta fees have been unchanged since launch. The grower groups complain that a fair payment system is one-time only at the time of seed purchase.

A Rio Grande do Sul court last year granted Monsanto the right to charge royalties on its first-generation Roundup Ready soybeans. The company agreed a deal with Brazilian soybean growers earlier in 2013 for royalty payments on Intacta soybeans. The deal freed participating farmers from paying royalties on first-generation soybeans for the next two seasons, and waived all potential legal claims for payments previously made for the first-generation technology.
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GENERAL INFORMATION

Agenda

| Time:16:00-18:00,2015-10-26 | The 7th Meeting of the 9th Session Standing Executive Council | Sheraton Shanghai Hotel |
| Time:09:00-17:00,2015-10-27 | Conference of Theme-Sponsored by Yangnong | Sheraton Shanghai Hotel |
| Time:09:00-17:30,2015-10-28 | 2015 International Forum on Crop Protection | Sheraton Shanghai Hotel |
| Time:09:00-17:30,2015-10-28 | 2015 China International Forum on Procurement and Service of Pesticides -Sponsored by Renxin | Sheraton Shanghai Hotel |
| Time:09:00-12:00,2015-10-29 | 2015 China Agrochemical Industry Summit-Sponsored by Fuhua Tongda | Shanghai World Expo |
| Time:09:00-12:00,2015-10-29 | 2015 China Agrochemical New Product and Technology Conference | Shanghai World Expo |
| Time:14:00-17:30, 2015-10-29 | CCPIA-PMFAI Agrochemical Entrepreneurs Technical Forum(Sino-India) | Sheraton Shanghai Hotel |

2015 National Agrochemical Exchange Meeting

Conference of Theme-Sponsored by Yangnong

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<td>Pesticide Registration Management in New Situation</td>
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<td>Liu Changling</td>
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<td>Huang Wenyao</td>
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<td>Martin Clark</td>
<td>Former Director of Global Quality and HSE of Dow AgroSciences</td>
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### 2015 China International Forum on Procurement and Service of Pesticides—Sponsored by Trustchem

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Global agchem sales up 5% in 2014

Global agrochemical sales rose by 4.5% to $56,655 million at the distributor level in 2014, according to figures from Agrow’s sister UK consultancy company, Phillips McDougall. The figures relate to the “prevailing agricultural season”, which for southern hemisphere countries includes July 2013 to June 2014.

Crop prices started the year strongly but weakened, with Phillips McDougall noting destocking in Thailand hitting prices. Glyphosate herbicide prices weakened, while growers traded up to more advanced products. Currency effects had an impact in 2014 as in the previous year. The US dollar strengthened against most major currencies except the euro. Volume sales growth was a key factor in developing markets.

When currency movements and inflation have been removed from the results, estimated underlying “real” growth in the crop protection market came in at 5.4%.

Sales of all pesticides including non-crop products grew by 4.2% to $63,212 million. Non-crop pesticide sales rose by 1.2% to $6,557 million. The growth of the latter mirrored that of the previous year.

<table>
<thead>
<tr>
<th>Global pesticide market ($ 000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market segments</td>
</tr>
<tr>
<td>Agrochemicals</td>
</tr>
<tr>
<td>Non-crop pesticides</td>
</tr>
<tr>
<td>Total pesticides</td>
</tr>
</tbody>
</table>

Source: Phillips McDougall.

Regions

Latin American markets again recorded the strongest growth in dollar terms, but at a slower rate than in 2012/13. The region also became the world’s principal crop protection market, rising by some 15.1% to $16,147 million. The 2013/14 market started with a shift in planting from maize to soybeans following the excellent US harvest and lower prices. A dry start to 2014 resulted in lower Asian soybean rust (Phakopsora pachyrhizi) pressure. That, along with a reduced sugar cane harvest and low crop prices, held back growth of the Brazilian market. Argentina was more positive. Despite trade restrictions on crops and agrochemicals, the devaluation of the peso and high inflation, the market performed well as it benefited from better weather. The 2014/15 season again got off to a good start, although low maize prices affected planted acreages. Agrochemical market growth in “developing” Latin America was sustained. After elimination of currency and inflationary/pricing effects (real growth), the regional market grew even faster at 19.3%, and after elimination of currency effects only (constant dollar) by some 29.1%.

The crop protection market in Asia experienced a difficult year, yet grew slightly. A deficient monsoon resulted in dryness in some regions, while trade was affected by currency fluctuations against the dollar. Rising wage costs for agricultural workers, lower glyphosate prices and weaker palm oil prices impacted profitability. Rice prices continued to decline, mainly due to de-stocking in Thailand. Market conditions were good in India, but a weak monsoon resulted in water shortage in parts of the country, holding back growth. Dryness was also a factor in northern China, parts of Thailand and the Philippines, while Australia’s major drought period continued. Japan returned another steady performance in 2014, with recovery from the 2011 tsunami continuing. The regional market was up 1.5% at $14,644 million. Real growth came in at 1.8% and constant dollar growth at 5.3%.

Europe benefited from a mild winter and early spring, although, parts of mid Europe suffered from a cool wet summer. Northern Europe enjoyed excellent growing conditions and a positive crop protection market, while more southerly areas had less cause for cheer. The market in central Europe was generally good, but Ukraine suffered due to the political upheaval and reduced trade into the country. The European market rose by 1.8% to top $13,885 million. Real growth totalled 1.7% and constant dollar growth some 4.8%.

The Canadian market was held back by adverse weather, high on-farm crop stocks and prohibitive transport costs. The planted areas of maize and small-grain cereals decreased, but canola and soybean areas rose. In the US, the planted area of maize declined due to lower crop prices, but soybean and cotton improved. The maize and soybean season got off to a poor start, depressing the pre-emergence herbicide market. Dryness again affected south and west US and Mexico. The NAFTA market fell by 2% to $9,810 million. The real fall amounted to 2.2% and the constant dollar decline was only 0.4%.

Growth in the rest of the world including Africa and the Middle East, where export crops dominate, totalled 3.1% at $2,169 million. The Zambian market continued to benefit from farmer migration from Zimbabwe and South Africa, while Nigeria also performed well.

<table>
<thead>
<tr>
<th>Crop protection sales by region ($ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region</td>
</tr>
<tr>
<td>Latin America</td>
</tr>
<tr>
<td>Asia</td>
</tr>
<tr>
<td>Europe</td>
</tr>
<tr>
<td>NAFTA</td>
</tr>
<tr>
<td>Rest of the world</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Source: Phillips McDougall.

Outlook

Good harvests have led to lower commodity prices, depressing sentiment for the crop protection market. However, further growth of the global market is anticipated in 2015, but below last year’s rate.

At the product level, increased sales of new fungicides and insecticides are anticipated this year, driven by resistance issues
and for use on bee-sensitive crops in the EU. Due to high supply, glyphosate prices are anticipated to weaken further.

The outlook for Latin America remains positive, although growth is not expected to reach 2013/14 levels due to the shift in planting in Brazil and Argentina, lower crop prices, drought in Brazil, trade issues and inflation in Argentina, and further uptake of genetically modified crops cannibalising sales of pesticides in Brazil. Domestic demand and an improving economic situation should sustain growth in developing Latin America. In North America, there is a contrast between Canada with a positive outlook, and the US, which is suffering lower maize acreages and maize prices, likely leading to depressed fungicide usage and falling glyphosate prices.

There is a mixed outlook for the EU. Lower wheat prices and reduced subsidies will hit traditional member states, but central and eastern Europe should gain increased support while lower production costs insulate the region from falling crop prices. There is also potential for volume growth in southern Asia and Australia, which were hit by adverse weather last year.

Phillips McDougall predicts global volume growth of 1-2%, although much will depend on favourable weather conditions. It also forecasts further weakening of glyphosate prices.

Following another record harvest in the US the outlook for maize in 2015 remains weak. US prices have dropped and this has already had an impact on crop planting, with Argentina and Brazil switching from maize to soybeans, and with planting intentions in the US indicating a similar swing. But, all-time high soybean stocks and the likely increased production have caused a drop off in soybean futures prices around the 2015 US harvest time.

The outlook for wheat is also weak. The 2014/15 wheat area has risen in Argentina, but offset by a decline for barley, forecast to fall in the US and the EU-28, but is expected to rise in Canada. Domestic prices in the US have remained strong, with prices rising since stocks have declined following the sell-off of the crop by Thailand.

Meeting

Cobradan VII

The Cobradan VII – Brazilian congress on natural pesticides – will take place at the Ailton Raseira auditorium of the agricultural research corporation, Embrapa Clima Temperado, Pelotas-Rio Grande do Sul state on October 20th-22nd 2015. Among other topics, the event will cover: selection strategies of microbial antagonists of plant pathogens; selection of organisms and molecules for pest management; discovery of novel actinomycetes with herbicide activity; active principle prospecting for insect, pest and disease control; and consolidation of biological herbicides as viable products. For more information, contact: email: cesar.gomes@embrapa.br; Tel: +55 53 3275 8152; Internet: http://www.cpact.embrapa.br/eventos/2015/outubro/cobradan/

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Sumitomo Chemical to establish Brazil R&D centre

Sumitomo Chemical plans to establish a Latin American crop protection research centre in Sao Paulo, Brazil. Construction is planned for 48 ha of research buildings and trial fields in 2016. The facility would conduct efficacy trials, research and development, and analyses of pesticide products. It would be the company’s first R&D facility in Latin America and the only one in the southern hemisphere. It would be run by the company’s Brazilian subsidiary, Sumitomo Chemical Brazil.

The centre would accelerate the development of products aimed at the region’s conditions. The company notes the regional agrochemical market’s rapid growth “in recent years”, raising its global market share to some 25%, and Brazil’s status as the world’s largest national market. Sumitomo also anticipates “greater growth [across Latin America] in the years ahead in agricultural production, hence, demand for crop protection products”.

Argentina

In 2013, Sumitomo opened a sales branch office of Sumitomo Chemical Brazil in Argentina. The company merged two of the group’s companies in Chile dealing respectively with post-harvest treatment and crop protection earlier this month. Sumitomo seeks further regional expansion, it says.

Embrapa seeks 2016 launch for GM feijao beans

The Brazilian agricultural corporation, the Embrapa, seeks to launch its genetically modified mosaic virus-resistant feijao beans in Brazil, national media report. The sale and use of the beans were authorised in 2011. However, the beans have proven susceptible to an “unidentified pest”, hindering potential demand for and effectiveness of the product.

The Embrapa reportedly says that during the development of the beans, incidences of losses from another virus, Carlavirus, which also affects conventional beans, were detected. Its incidence was overshadowed by the golden mosaic virus, which is much more aggressive. New tests were carried out, including management practices that can reduce the damage caused by the new virus. The Ministry of Agriculture is analysing an application to safeguard the product’s registration. The Embrapa notes that public bodies, unlike private enterprises in Brazil, only complete development of products following CTNBio authorisation.

GM soybean

The Embrapa recently launched along with BASF the first GM soybean to be developed in Brazil.
Homologa™ is updated constantly.

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The Global Crop Protection Database

www.homologa.com

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- 180 000 Brands
- 20 Mio lines of Crops / Pests + use info

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... work on global level with a single system
... have an alert system for new registrations
... and the system is translated in English and Latin (pests).

A video presentation is available on Youtube:
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http://www.agrobase-logigram.com
homologa-info@agrobase-logigram.com
Phone:+33 (0)4 50 35 07 19
Fax:+33 (0)4 50 35 07 26
US led GM crop growth in 2014

The US led the growth in absolute terms in the cultivation of genetically modified crops in 2014, according to the International Service for the Acquisition of Agri-Biotech Applications (ISAAA). The 3 million ha increase was larger than for any other country in the world, including Brazil, which had headed GM crop growth for the previous five years. Worldwide plantings were up by 3.6% to 181.5 million ha, making a “remarkable” 19 consecutive years of growth, the ISAAA points out.

The US remained by far the largest producer of GM crops at 73.1 million ha, representing 40% of the global total. The 4.3% annual increase in the GM crop area was mainly due to an 11% rise in the total planted area of soybeans to a record 34.3 million ha, the ISAAA notes. Despite very high levels of adoption in 2013, adoption rates increased for each of the principal crops last year: soybeans from 93% to 94%; maize from 90% to 93%; and cotton from 90% to 96%.

Brazil continued to be the second-largest producer of GM crops at 42.2 million ha. In percentage terms, the 4.7% expansion in 2014 was slightly greater than that seen in the US but the actual area increase of 1.9 million ha was smaller. Brazil accounted for 23% of the global GM crop area, which was the same proportion as in 2013. The country is expected to close the gap with the US, the ISAAA points out. GM crop plantings in Argentina were flat at 24.3 million ha.

India and Canada each planted some 11.6 million ha of GM crops last year. The 11.6 million ha of insect-resistant Bt cotton planted in India was 5.5% higher than in the previous year and represented an adoption rate of 95%. Canadian GM crop plantings grew by 7.4% due to more cultivation of GM soybeans and canola. Canada planted 8 million ha of GM canola (95% adoption) and over 2 million ha of GM soybeans.

GM crop plantings in China dropped by 7.1% to 3.9 million ha. Overall cotton plantings in the country fell from 4.6 million ha to 4.2 million ha but the adoption rate of GM cotton rose from 90% in 2013 to 93% last year. Plantings of virus-resistant papayas grew by almost 50% from 5,800 ha to 8,475 ha.

The cultivation of GM crops in Africa continued to progress last year. Plantings of Bt cotton in Sudan increased by some 46% to 90,000 ha, while plantings in South Africa and Burkina Faso were marginally lower. An additional seven countries (Cameroon, Egypt, Ghana, Kenya, Malawi, Nigeria and Uganda) conducted field trials on a broad range of GM crops.

As in 2013, five EU countries (Czech Republic, Portugal, Romania, Slovakia and Spain), planted GM crops last year. Plantings were down by 3% to 143,016 ha, mainly due to lower maize plantings, particularly in Spain. The country had an adoption rate of 31.6% and grew 92% of all the Bt maize in the EU.

<table>
<thead>
<tr>
<th>Country</th>
<th>2013</th>
<th>% change</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>70.1</td>
<td>+4.3</td>
<td>73.1</td>
</tr>
<tr>
<td>Brazil</td>
<td>40.3</td>
<td>+4.7</td>
<td>42.2</td>
</tr>
<tr>
<td>Argentina</td>
<td>24.4</td>
<td>-0.4</td>
<td>24.3</td>
</tr>
<tr>
<td>India</td>
<td>11.0</td>
<td>+5.5</td>
<td>11.6</td>
</tr>
<tr>
<td>Canada</td>
<td>10.8</td>
<td>+7.4</td>
<td>11.6</td>
</tr>
<tr>
<td>China</td>
<td>4.2</td>
<td>-7.1</td>
<td>3.9</td>
</tr>
<tr>
<td>Paraguay</td>
<td>3.6</td>
<td>+8.3</td>
<td>3.9</td>
</tr>
<tr>
<td>Pakistan</td>
<td>2.8</td>
<td>+3.6</td>
<td>2.9</td>
</tr>
<tr>
<td>South Africa</td>
<td>2.9</td>
<td>-6.9</td>
<td>2.7</td>
</tr>
<tr>
<td>Uruguay</td>
<td>1.5</td>
<td>+6.7</td>
<td>1.6</td>
</tr>
<tr>
<td>Bolivia</td>
<td>1.0</td>
<td>0</td>
<td>1.0</td>
</tr>
<tr>
<td>Philippines</td>
<td>0.8</td>
<td>0</td>
<td>0.8</td>
</tr>
<tr>
<td>Australia</td>
<td>0.6</td>
<td>-16.7</td>
<td>0.5</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>0.5</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>Myanmar</td>
<td>0.3</td>
<td>0</td>
<td>0.3</td>
</tr>
<tr>
<td>Mexico</td>
<td>0.1</td>
<td>+100.0</td>
<td>0.2</td>
</tr>
<tr>
<td>Spain</td>
<td>0.1</td>
<td>0</td>
<td>0.1</td>
</tr>
<tr>
<td>Colombia</td>
<td>0.1</td>
<td>0</td>
<td>0.1</td>
</tr>
<tr>
<td>Sudan</td>
<td>0.1</td>
<td>0</td>
<td>0.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>175.2</strong></td>
<td>+3.6</td>
<td><strong>181.5</strong></td>
</tr>
</tbody>
</table>

1 includes nine countries (Bangladesh, Chile, Costa Rica, Cuba, Czech Republic, Honduras, Portugal, Romania and Slovakia) each with plantings of less than 50,000 ha. Source: ISAAA.

Bangladesh began commercial cultivation of Bt aubergines last year following approval in 2013. Cultivation of the crop remained blocked in India and the Philippines. Vietnam and Indonesia approved GM crops in 2014 for cultivation this year. Vietnam approved GM maize and Indonesia authorised drought-tolerant sugar cane. That would bring the number of countries in Asia growing GM crops to nine.

Thirteen countries planted GM crops with two or more traits in 2014, which was the same number as in 2013. Stacked-trait crops accounted for 28% of the global GM crop area last year compared with 27% a year earlier.

The number of farmers growing GM crops amounted to some 18 million, which was the same as in 2013. Some 16.5 million were small-scale crop farmers in developing countries, the ISAAA estimates. It puts the number of such farmers in India at 7.7 million and in China at 7.1 million. For the third consecutive year, developing countries planted more GM crops than industrialised nations. Latin American, Asian and African farmers grew a total of 96 million ha of GM crops, or 53% of the total (54% in 2013), compared with industrialised countries at 85 million ha or 47% (46%).

The global value of GM crop seed was valued at $15.7 billion in 2014 compared with $15.6 billion in 2013, according to UK market research company Cropnosis cited by the ISAAA. That represents 22% of the $72.3 billion crop protection market and 35% of the $45 billion seed market.
17th China International Agrochemical & Crop Protection Exhibition

9-11 Mar., 2016
Hall N1-N5, Shanghai New International Expo Centre

CACE 2016
17th China International Agrochemical & Crop Protection Equipment Exhibition

Fshow 2016
7th China International Fertilizer Show

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Bassiana with a microgranular formulation of the bioinsecticide, employed a drone specifically for the treatment of palm trees in collaboration with its partners, Vegetech and MC-Clic, have seen better control since the launch of triazole/strobilurin mixtures in 2003. DuPont’s technology enables treatment and drastically reduces costs. Treatment of trees are difficult due to the trees’ height and location but use of this drone enabled a targeted treatment of palm trees.

Best Application Technology Innovation

Arysta LifeScience (part of Platform Specialty Products) in collaboration with its partners, Vegetech and MC-Clic, have employed a drone specifically for the treatment of palm trees with a microgranular formulation of the bioinsecticide, Beauveria bassiana, to control red palm weevils. Conventional treatments are difficult due to the trees’ height and location but use of this technology enables treatment and drastically reduces costs.

DuPont’s aqueous suspension concentrate formulation was developed to prevent blockages in drip chemigation systems. A combination of non-phytotoxic, non-ionic surfactants was employed to prevent the flocculation and sedimentation that causes blockages in slow flowing drip systems. The insecticide, Verimark (cytrraniliprole – trade-marked as Cyazypyr), was developed as an aqueous suspension concentrate formulation specifically for soil application and drip chemigation.

Willowood Crop Sciences has introduced “trigger sprayer” caps in India for use with its N-Wilstay products for the denitrification of fertilisers. The unique packaging enables the farmer to uniformly spray the liquid product on the fertiliser before application, which avoids wastage and optimises utilisation of the chemical.

Best Formulation Innovation

Dow AgroSciences’ Arylex water-dispersible granule formulations with GoDri RDT technology combine Dow’s proprietary herbicide, Arylex (halaxifen-methyl), with other herbicidal active ingredients in a series of innovative pre-mix formulations that deliver: multiple modes of action, low use rate, rapid dispersion, robust performance in tank mixes with other herbicides, and flexible storage conditions. Arylex was introduced in 2014 in liquid and dry formulations.

DuPont’s novel suspension concentrate formulation with built-in adjuvant greatly improves the wettability of spray droplets on rice leaf surfaces. It demonstrates better spray features and unprecedented user safety. No specialised equipment is needed, no training required and neither are any fumigant management plans, buffers, restricted entry intervals or complicated personal protective equipment.

Nimitz (fluensulfone) is a broad-spectrum nematicide from a new chemical class with a novel mode of action. It causes irreversible effects rather than temporary nematostatic activity. Nimitz has simple application features and unprecedented user safety. No specialised equipment is needed, no training required and neither are any fumigant management plans, buffers, restricted entry intervals or complicated personal protective equipment.

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EASTCHEM CO., LTD.

EASTCHEM, as the headquarters located in Changzhou, Jiangsu, covers two factories Nantong Wellike Chemical Co., Ltd and Jiangsu LionChem Co., Ltd as technical and formulation base in Yangkou Coastal Economic Development Zone, Nantong, Jiangsu. The company aims at supplying pesticide via research and development, production, sale and registration, also developing new environmental pesticides, and will try the best to satisfy the customers.

**PRODUCT LIST**

<table>
<thead>
<tr>
<th>INSECTICIDE</th>
<th>SAFENER</th>
<th>FUNGICIDE</th>
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<tbody>
<tr>
<td>Acephate</td>
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<td>Oxadixyl</td>
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<tr>
<td>Chlorfluazuron</td>
<td>Cloquintocet-mexyl</td>
<td>Tridemorph</td>
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<tr>
<td>Fipronil</td>
<td>Mefenpyr-diethyl</td>
<td>Fenpropimorph</td>
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<tr>
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<tr>
<td>Cyhalofop-butyl</td>
<td>Metaldehyde</td>
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<tr>
<td>Pyribenzoxim</td>
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<table>
<thead>
<tr>
<th>PRESERVATIVE</th>
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<tbody>
<tr>
<td>1-Methylcyclopropene</td>
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</table>

Address:
Floor 26, Haoyuan Mansion, No.266 Middle Tongjiang Road, Changzhou, Jiangsu, China.
Tel: +86-519-6878 6888 Fax: +86-519-8519 0399 6878 6598
E-mail: zhu@eastchem.net Website: www.eastchem.net

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**TRIALCAMP**

AGRICULTURAL RESEARCH

- Efficacy trials (GEP)
- Residue trials (GLP)
- Soil Degradation trials (GLP)
- Ecotoxicology trials (GLP):
  - Effects on honey bees and pollinators
  - Effects on soil organisms
  - Effects on other arthropods (NIA)
  - Effects on non target plants (NTP)
- Processing studies (GLP) and Taint Test studies
- Post-harvest trials (specialist) (GEP)

GEP Certification No: EC/115/08 / GLP Certification No: B/61/12
droplet distribution and retention, with improved efficacy and residual control. An improvement in rice leaf deposition and coverage was confirmed in field trials with the insecticide, dichloromethane, for rice stem borer control. The amount of active ingredient required was reduced over the formulation without built-in adjuvant.

Scholkovo Agrochim JSC’s micro-emulsion formulation of the herbicide, Argo (fenoxaprop-ethyl + clodinafop-propargyl + mefenpyr-diethyl safener), offers a complete solution for grass weed control in wheat. The formulation provides rapid and deep penetration of the treated surface, maximum effectiveness and prolonged protection. It guarantees total stability of the solution so it does not break down and sediment.

Rotam North America has received approval for its insecticide, Abacux V (abamectin), in the US state of California, which has mandated a reduction in volatile organic compound (VOC) emissions for all crop protection products with over 30% volatility. With lower VOC emissions, Abacux V has the same effectiveness and application rate as the original abamectin products, so growers do not have to change any of their measuring practices.

The properties of the active ingredients in Syngenta’s fungicide, Elatus (benzonidifluorpyr – trade-marked as Solatenol + azoxystrobin), make its formulation challenging. The company developed a novel solid formulation using proprietary Pepite technology. The formulation handles like a liquid, is dust free, disperses rapidly and behaves favourably in the sprayer. The concentrated formulation reduces the volumes that need to be shipped and packs are easy to dispose.

**Best New Biopesticide**

BioProdex claims SolviNix to be the world’s first bioherbicide containing a plant virus as the active ingredient. Its mode of action consists of a genetically programmed hypersensitive host response that results in systemic plant necrosis. Unlike chemical herbicides, SolviNix controls its target, *Solanum viarum*, in a highly selective and safe manner without killing beneficial non-target plants, residue problems, or health risks.

Deqiang Biology presents its biofungicide, ningnanmycin, as the world’s first and only biological control for viral diseases in plants. It works against tobacco mosaic virus on a number of fruit and vegetable crops. It is also effective against fungal diseases such as powdery mildew, root rot, stem rot, blight, gummy stem blight, anthracnose as well as bacterial diseases. Ningnanmycin sales reached $12 million in 2014.

Marrone Bio Innovations (MBI) showcases its broad-spectrum bioinsecticide, Venerate (*Burkholderia* spp strain A396). It is active against a wide array of chewing and sucking insects and mites and features novel modes of action that stem from a diverse set of chemical compounds extracted from a newly-discovered bacterium. It is the first biopesticide that has been developed from the company’s in-house discovery screening process.

Wangs Crop-Science’s Lordship is an anti-fertility rodenticide extracted from plants. It decreases the rodent’s pregnancy rate through strong anti-implantation activities affecting the ovary and uterus of female rodents. It causes miscarriage to the pregnant rodents by extending the rodenticide application time during the breeding season. The controlling effect is enhanced as time goes by and the population drops to only 3-4% in three years.

**Best Marketing Campaign**

The Andef Award from the Brazilian Crop Protection Association, the Andef, has reached its 17th year, annually given to recognise those who help build the sustainable basis of Brazilian agriculture. The Award focuses on initiatives launched by professionals and entities that act to strengthen agricultural production through education projects. Known as the “Brazilian Agriculture Oscar,” the Andef Award has rewarded projects that have directly and positively impacted more than 18 million people in Brazil.

Bayer CropScience UK debuted a new app combining three previous apps to offer growers important information on pests, weeds and product usage. The Bayer Agronomy Tool app works on iOS and Android devices, incorporating and building on the functionality of the company’s Pest Spotter, Weed Spotter and Product Manual apps. All imagery and content is stored locally on the user’s device so the app does not rely on having an Internet connection.

A new campaign by Dow AgroSciences called “Don’t Let Weeds Consume You” helped the company inform customers about its new weed control solution for soybean farmers with upwards of 250 acres (100 ha). The centrepiece of the effort was an image of a grower whose beard, eyebrows and hair under his shirt are made of weeds. The campaign was a hit for the company, building initial awareness and interest in the product.

Stockton’s campaign focused on the curative activity of the biofungicide, Timorex Gold (*Melaleuca alternifolia* extract), and boosted recognition and sales of the product across the banana crop industry. The multimedia effort focused on the product’s effectiveness in controlling black sigatoka (*Mycosphaerella fijiensis*), highlighted it as a sustainable alternative that can reduce chemical load and boost yields. Website visits have jumped from an average of 500 per month prior to the campaign to 5,000.

Syngenta Crop Protection’s Brazilian campaign for its new solution for soybean rust control featured an intensive effort with wide geographic, customer and influencer reach. The launch of the fungicide, Elatus (benzonidifluorpyr – trade-marked as Solatenol + azoxystrobin), has proven a marked success, with more than 12 million ha treated and more than a 25% share of the soybean rust fungicide market gained in the launch year.

**Best Stewardship Programme**

Australia’s Agsafe drumMUSTER programme has collected and recycled over 25 million empty agvet chemical containers in
HUAXING CHEMICAL

- Established in 1984
- Listed company on China Stock Exchange
- Certified under ISO 9001 and ISO 14001
- GLP Registration Dossier Support

Herbicides
- Fenoxaprop-P-ethyl 97% TC
- Glyphosate 96% TC
- Glyphosate-ammonium 98% TC
- Glufosinate-ammonium 95% TC
- MCPA 95% TC
- MCPA-2-ethylhexyl 93% TC
- Nicosulfuron 97% TC
- Quizalofop-P-ethyl 97% TC
- Tribenuron-methyl 97% TC

Insecticides
- Cartap 98% TC
- Chlorpyrifos 97% TC
- Dichlorvos 94% TC
- Fipronil 95% TC, 97% TC
- Imidacloprid 95% TC, 97% TC
- Lambda-cyhalothrin 97% TC
- Phosalone 95% TC
- Pirimicarb 95% TC

Fungicides
- Carbendazim 98% TC
- Fiuilazole 95% TC
- Kresoxim-methyl 96% TC
- Thiophanate-methyl 97% TC

* We can provide IDA, PM/IDA, the intermediates of Imidacloprid, Fipronil and Quizalofop-P-ethyl.

We produce the formulations: WP, WDG, SP, SC, SL, FS, EC, EW.
We package for solid formulations from 1G to 25KG, for liquid formulations from 19L to 1KL IBC.

ANHUI HUAXING CHEMICAL INDUSTRY CO., LTD
Head Office: No. 6 Hongfeng Road, Hefei City, Anhui Province, P.R. China P.C.: 230088
Factory: Wujie Town, Hexian County, Anhui Province, P.R. China P.C.: 230251
Tel: 0086-551-65848155/65848120  Fax: 0086-551-65848133
E-mail: trade@huaxingchem.com  http://www.huaxingchem.com

New Plant
Jiangxi Tianyu Chemical Co., Ltd.
Integrated Plant For 20000T/a 2,4-D

CAC GROUP
- Founded in 1992
- 2014 turnover: US $235Mio
- 1 R&D Center – 60* Professionals
- 5 plants – 1800* employee
- 1 strategic GLP / ISO17025 LAB partner (Green Tech Laboratory / 2015 ACE Booth NO.: 1071-A)

ACE2015 (October 28-30)
Booth NO.: 1C66

Odorless
2,4-D 98% TC

Cost competitive
Azoxystrobin 98% TC

High quality
Chlorothalonil 98.5% TC

New formulation
Glyphosate 95% TC
15 years, while ChemClear has collected and safely destroyed over 500,000 litres of unwanted and obsolete chemicals in a decade. Agsafe’s innovative approach to chemical waste reduction and provision of advice and support to agvet chemical product handlers and sellers serves as a blueprint to other stewardship initiatives. It is Australia’s leading environmental stewardship organisation.

The Brazilian crop protection association, the ANDEF’s Agro Programme +: For a More Sustainable Agriculture is aimed at disseminating among rural producers the demands of society and translating them sustainably into their productive system. It has transformed abstract concepts of sustainability into 51 GAP measures, in five areas: phytosanitary, soil and water, environment, social safety and property management. That facilitated calculating a Sustainability Index for participating municipalities.

The aerial spraying of pesticides is fundamental for large-scale production in Brazil. The Andef’s CAS Programme aims to establish clearer technical efficiency, responsibility and environmental safety parameters, through a partnership with an agriculture research body, the Fepaf. It is developing a voluntary system that certifies companies and pilots through legal, technological, and structural criteria, assuring society that companies are working in conformity with good practice.

CropLife Australia’s Pollinator Protection Initiative (PPI) is the first agricultural industry stewardship programme of its kind. It employs industry collaboration, technology and innovation to provide resources that ensure that crop protection products are used in a manner that minimises risk to pollinators. BeeConnected, the PPI’s second component, is a pioneering smart-phone app and website being rolled out internationally. Both components have the Australian Honeybee Industry Council and nationwide industry support.

The Brazilian recycling organisation, the InpEV’s itinerant receiving programme is aimed at the irrigated districts of the state of Ceará, where small rural properties prevail, with little access to technological resources. There, the empty packages return system does not count on stationary receiving depots, as maintenance costs would be unfeasible. The InpEV’s Campo Limpo system is able to expand its outreach to almost 5,000 additional collection points, besides the 400 fixed stations.

The Mediaie Company’s programme, Shamba Shape Up is Africa’s hit agricultural TV show, reaching over 10 million farmers across East Africa each week, showing farmers being “shaped up” with tried and tested practices – including safe agrochemical use, correct application of chemicals and disposal of empty containers. In 2014, nearly 90% of the audience learned something, 45% adopted something and 90% of those said it had increased income or food for their household.

**Best Public Outreach Programme**

The Brazilian crop protection association, the Andef’s 2050 Challenge seeks to counter perceptions that feeding the world is a more complex challenge than simply food production. Supplying 9.3 billion people in 2050 demands that Brazil and the world reduce losses and waste, open world commerce, invest in innovation and guarantee family rural producers income in a sustainable way. Challenge 2050 is the main Brazilian tool between society and the rural economy to meet this challenge.

Bayer CropScience established its BeeCare programme in 2011 to bring education, research and collaboration efforts under one roof, including opening two Bee Care Centers in Germany and the US. The company has sought to identify solutions for bee health for 30 years. It sees the health of bees as a shared responsibility among stakeholders, seeks to broaden understanding and shift conversation from blaming solely pesticides towards a multiplicity of factors.

Biostadt India’s Awakening the Farmer (Jaago Re Kissan – JRK) flagship campaign’s key objective is to challenge traditional farming practices and usher in new ways of farming that will break farmer stereotypes. It aims to motivate farmers about the role of agriculture and its contribution in building the nation. JRK is an ambitious campaign to educate farmers and create awareness among them for GAP measures and overhaul farmers’ all-round livelihood.

CropLife International’s Cocoa in West Africa project travelled to Ghana to tell the story of small-scale cocoa farmers. It developed a bespoke micro-site launched last year featuring six high-quality short films to help the crop protection industry explain its role to the development community and beyond. It advocated crop protection tools as vital to stem 40% production losses of the well-loved crop.

DuPont Crop Protection Brazil has implemented its comprehensive Safety & Health Outreach Program utilising various initiatives. They engage several stakeholders to promote sustainability, and stewardship principles including the proper use of personal protective equipment, IPM, resistance management and correct disposal of used containers. The unique aspect is its use of five initiatives under a single programme: DuPont in the School; DuPont Women in the Field; DuPont Nature; DuPont Safe Use and DuPont University.

**Best Supplier**

Jiangsu Yangnong Chemical is a leading Chinese supplier of pyrethroids, with annual production of some 6,500 tonnes. The company also produces 38,000 tonnes of other pesticides and intermediates. Yangnong’s sales team focuses on “service first, sales second” and the company has received several national awards for customer service and reliability.

Maxunitech is a Chinese company focused on providing either the first or the best generic agrochemical product and service to its customers. The company specialises in developing and delivering off-patent molecules and proprietary formulations for the global market. Maxunitech highlights its success in...
Hubei Sanonda Co Ltd is a large-scale chemical enterprise with salt chemical as base, Agrochemical as backbone, and fine chemical as characteristic. Sanonda was listed on Shenzhen Stock Exchange in 1993, as the first Agrochemical enterprise. From then on, Sanonda has been always among the best in Agrochemical sector of China.

Main products:

- **Acephate** 乙酰甲胺磷, DDVP 敌敌畏, Trichlorfon敌百虫
- **Chlorpyrifos** 毒死蜱Triazophos三唑磷, Isocarboxphos水胺硫磷
- **Imidacloprid** 吡虫啉, Carbofuran克百威,Isoprocarb异丙威
- **BPMC**仲丁威, Carbosulfan丁硫克百威, Methomyl灭多威
- **Glyphosate**草甘膦, 2,4 D2. 4滴, Paraquat 百草枯
- **DMPAT**精胺, PMIDA双甘膦。

For business, pls. contact Sanonda International:
S3, East Beijing Road, Jingzhou, Hubei, China
Tel: 0086-716-8318975/8320920/8325294/8311746
Fax: 0086-716-8315265
Website: www.sanonda.cn
Zhang Ziyun, General Manager, zzy@sanonda.com
Guo Xiang, Vice General Manager, Larry@sanonda.com
Tan Xianwu, Manager for Business Development, txx@sanonda.com
producing generic versions of the herbicide, flufenacet, and the fungicide, boscalid, as recent key achievements.

**Marrone Bio Innovations (MBI)** is advancing an insecticide into Dow’s pipeline. Of Dow driving the later stages of series optimisation toward series, achieving many of the initial goals. The initial plan marketplace. The team successfully discovered an insecticidal pest resistance and the ever-changing demands of the field, namely MBI’s expertise in microbial-based solutions and it has innovated chlorine recycling technology and touts its development of new glyphosate formulations.

**Best Industry Collaboration**

**Dow AgroSciences** and **GVK Biosciences** began a collaboration to discover novel early-stage agricultural products to address pest resistance and the ever-changing demands of the marketplace. The team successfully discovered an insecticidal series, achieving many of the initial goals. The initial plan of Dow driving the later stages of series optimisation toward commercialisation was expanded to have both companies advancing an insecticide into Dow’s pipeline.

**Marrone Bio Innovations (MBI)** and **Evogene** entered a multi-year collaborative agreement in July 2014, targeting the joint discovery of novel modes of biological action for insect control, to be followed by the development and commercialisation of new insect control products by both companies. The partnership leverages the expertise of each company in its respective field, namely MBI’s expertise in microbial-based solutions and Evogene’s computational gene discovery capabilities.

**Best Supporting Role**

**Agrobase Logigram (ABL)** serves the industry with Homologa, a unique international database about registered plant protection products (PPPs) and their maximum residue limits (MRLs). The database holds detailed information about PPPs and MRLs in more than 70 countries, enabling users to produce unique multi-country reports of registered uses of PPPs, per crop and pest/disease.

**Croda** has a broad range of additives and adjuvants and unique formulation expertise that can help agrochemical customers get the best performance out of their active ingredients, enabling farmers to get the best yields for their crops. The company touts its strengths in technology, innovation, global supply, quality and sustainability.

**Compliance Services International (CSI)** supports registrants by presenting specialist assessments on endangered species, higher tier aquatic risk, endocrine disruptors, new product development and other issues. CSI has also been a strong contributor to professional and trade organisations and provided significant input to the development of the programme for the 13th IUPAC International Congress of Pesticide Chemistry.

**Edinburgh Pharmaceutical Processes (EPP)** is a contract research organisation focused on supporting the crop protection industry. The company brings a blend of synthetic and analytical chemistry knowledge and understanding to bear on complex projects for its customers. It offers a comprehensive Five Batch Analysis service to help clients manage time and business risk across the whole process.

**EPL Bio Analytical Services** is a contract analytical laboratory that provides services customised for the agricultural industry. The company has provided data that have been used to support hundreds of crop protection products. It provides analytical support for all facets of agriculture from organic farming, GMOs and traditional pesticides to biopesticides.

A full-service European law firm, **Fieldfisher** has a dedicated pesticide team that assists clients across the globe with all aspects of EU regulatory compliance, data protection, task force formation, lobbying and litigation. The firm combines advisory and litigation work on REACH, pesticides and biocides at the EU and national levels.

**Nutrichem Laboratory** is an independent contract research organisation that provides scientific expertise and regulatory assistance to the crop protection industry. Based in Beijing, Nutrichem conducts physical-chemical testing, analytical and clinical chemistry testing, studies on behaviour in water and soil, residue, stability testing, genetic toxicology and eco-toxicity testing.

**Best company from an emerging region**

**Jiangsu Yangnong Chemical** is a large-scale chemical enterprise and China's largest production base for pyrethroids. It was listed on the Shanghai Stock Exchange in 2002, formed a subsidiary in 2013 and has developed into a multiple product supplier with a core of pyrethroids, accounting for 15% of its 44,000 tonnes production. Yangnong is designated as national pyrethroids standardisation technical committee working group, and holds various official citations on environmental protection and supply.

**Limin Chemical** is a large-scale agrochemical manufacturer in China, holding various official citations for its products. The company is largely focused on agricultural fungicide R&D, production and sales, and runs two production bases, a national R&D centre, a post-doctoral research station, and six varied companies, and a Vietnamese branch office. Limin exports to more than 70 countries, and holds several health and environmental certifications and citations.
Innovation for Agrochemicals

We Are Maxunitech

AgroChemEx 2015
Booth: 1A46

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maxunitech@maxunitech.com
Nanjing Red Sun is a hi-tech enterprise that focuses on manufacturing of “green” pesticides, eco-fertilisers, pharmaceuticals, intermediates and new materials. The company has 12 Chinese manufacturing bases, covering over 5 km², and more than 6,000 employees, of whom almost two-thirds have university level education. It has established three vertically integrated production chains through four pyrethroid, pyridine and HCN plants. Sales totalled $2.4 billion in 2014 and assets $3 billion.

PI Industries is a leading agri input and custom synthesis and manufacturing company in India. Its domestic agri inputs segment has continuously outperformed in its sector, emerging as a strategic partner for its customers that has built an enviable global business. It points to sustainable revenue growth, outstanding profit growth and leading equity and capital return levels as a result of its unique non-conflicting strategic business model.

Sichuan Leshan Fuhua Tongda Agro-Chemical Technology is China’s major producer of glyphosate herbicide, and the world’s second largest. It possesses an integrated industrial production chain involving phosphorus, brine, glyphosate and silicone, putting it at the competitive vanguard of the herbicide’s production. Fuhua exports glyphosate to the US, Asia, Africa, Oceania and Europe, with over 2,000 employees around the world, with sales offices in Shanghai and Singapore.

Most top 20 companies ahead in 2014

Nearly all of the leading agrochemical companies posted sales gains last year, but only Monsanto and Nanjing Redsun recorded double-digit increases in dollar terms. That compared with a stronger performance in 2013 when all of the top 20 firms saw growth and half posted double-digit dollar gains. The top six multinationals recorded sales gains for the fourth consecutive year in 2014. The 20 leading players were unchanged from the 2013 ranking, with only two positions swapped among the top 15 and some shuffling of places in the bottom quarter of the table.

ChemChina subsidiary Adama Agricultural Solutions maintained its position as the seventh-largest agrochemical company, with sales up by about 5%. The company recorded gains in each of its regions, with the strongest growth in Latin America.

Nufarm regained eighth spot from FMC with a 15.5% rise in agrochemical sales in Australian dollar terms and a nearly 8% increase in US dollars. The company saw double-digit percentage gains in each of its reporting currencies but saw single-digit dollar gains. Sumitomo Chemical and UPL each posted sales increases of about 12% in their reporting currencies but saw single-digit dollar gains. Sumitomo saw strong rises in North America and Asia (excluding Japan) and posted increases for all major product categories. UPL recorded growth in all regions, with its strongest gains in Latin America and India.

The next two companies made their final appearance in the top 20 ranking as Arysta LifeScience was acquired by Platform Specialty Products and Cheminova was purchased by FMC earlier this year. Arysta’s 2014 sales figure has not been disclosed. But Platform’s Agriculture Solutions pro forma sales (combining Arysta, Chemtura AgroSolutions and Agriphar) amounted to $2.149 million. Cheminova recorded growth of some 2.5%, with organic growth put at 5%. Gains in Europe, Latin America and elsewhere were partly offset by a decline in North America.

The next three spots were held by Chinese companies. Zhejiang Wyncas Chemical remained the largest Chinese company in terms of agrochemical revenues, with sales up by about 7% in yuan and 8% in dollars. Huapont-Nutrichem recorded a similar level of growth but Nanjing Redsun saw sales gains approach 20% due to strong demand for its herbicides.

The two Japanese companies in the lower quarter of the ranking had differing fortunes. Kumiai Chemical posted domestic and international sales growth, while Ishihara Sangyo Kaisha saw flat domestic sales and mixed results overseas. Sipcam-Oxon recorded a 1% sales increase, while Jiangsu Yangnong Chemical posted a drop of about 6%.
<table>
<thead>
<tr>
<th>2014 (2013) ranking</th>
<th>Company</th>
<th>$ million$</th>
<th>Reported currency million</th>
<th>% change $</th>
<th>% change reported</th>
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<td>1 (1)</td>
<td>Syngenta$^3</td>
<td>11,381</td>
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<td>2 (2)</td>
<td>Bayer CropScience$^4</td>
<td>10,252</td>
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<td>Dow AgroSciences$^5</td>
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<td>5 (5)</td>
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<td>DuPont$^7</td>
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<td>7 (7)</td>
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<td>-6.3</td>
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1 unless otherwise stated; 2 converted using average annual exchange rates for 2014 and 2013; 3 excludes lawn and garden sales of $693 million in 2014 and $691 million in 2013, and seed and trait sales of $3,155 million in 2014 and $3,204 million in 2013; 4 excludes environmental science sales of $678 million in 2014 and $651 million in 2013, and seed and trait sales of $1,104 million in 2014 and $974 million in 2013; 5 excludes seed and trait sales of $1,604 million in 2014 and $1,591 million in 2013; 6 year ended August 31st 2013/14 – excludes seed and trait sales of $10,740 million in 2013 and $10,340 million in 2013; 7 year ended March 31st 2014/15; 8 excludes seed technology sales of Aus$144 million in 2013 and Aus$112 million in 2013; 9 part of ChemChina, for which agrochemical sales are not disclosed; 10 year ended July 31st 2013/14 - excludes seed technology sales of Aus$144 million in 2013 and Aus$112 million in 2013; 11 year ended March 31st 2014/15; 12 part of ChemChina, for which agrochemical sales are not disclosed; 13 year ended August 31st 2013/14 – excludes seed and chemical sales of Rs 8,810 million in 2014 and Rs 9,260 million in 2013; 14 includes fine chemical sales – agrochemicals accounted for 93.7% of total sales in 2013; 15 year ended October 31st 2013/14.
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Becoming a leading Agri Input and Custom Synthesis company took us foresight, acumen and ability. But it all started with our foundation of trust. Our principles of complete business transparency and an adherence to the highest standards have made us global experts and a partner of choice in our business. We are confident that our belief in trust will lead us to infinite possibilities in the world of chemistry in time to come.

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ADAPTABILITY
Constantly transforming ourselves like water, we are nimble footed and highly responsive to change.

TRUST
We work with integrity of purpose, honesty in action and fairness in all our dealings.

SPEED
Blazing ahead, we constantly strive to work with speed in the way we observe, think and act.

INNOVATION
The constant quest for horizon, the never ending search for a better, newer way to do things. Innovation is a way of life for us.

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Inspired by Science
EXECUTIVE SUMMARY

1.1 Market share

Research based companies identify and develop agrochemical aids, which they protect with patents. This means they have a period when they can produce the pesticide with no competition, to recoup the substantial research and development costs. Subsequently, the patent protection will expire, enabling competitors to enter the market with their generic versions. Many companies manufacture aids for which the patents have expired, and for which they do not hold the original patent. However, very often the original patent holder will continue to dominate the market.

The agrochemical market can therefore be divided into proprietary aids (which still have patent protection and are sold only by the developing company or approved licensees) and off-patent aids (which have lost their patent protection). These off-patent aids can be divided into two classes: proprietary off-patent aids, which are produced and sold by the original developing company; and generic aids, produced and sold by companies other than the original developer.

In addition, companies other than the original developer may develop their own proprietary technology using the generic aid – perhaps a patented formulation or mixture. These are also sometimes defined as proprietary off-patent pesticides.

Proprietary aids are taking a smaller share of sales than ever before – estimates suggest around 20-30% of the global agrochemical market. This leaves 70% to 80% of the global agrochemical market based on aids that are off-patent.

Rotam estimates that proprietary off-patent pesticides took 45% of the market in 2009, and this will rise to 55% in 2014. This includes generic aids with some patented element to them. Other sources put the original developer as accounting for perhaps half of this. Rotam estimates that pure generics will remain a constant 25% between 2009 and 2014.

1.2 Patents

The global intellectual property system, including patents, is overseen by the World Intellectual Property Organization (WIPO). Its objectives are to promote the protection of intellectual property worldwide, and to ensure administrative cooperation. To gain a patent, an application must be filed. There are no world patents. Instead, an applicant must apply to a: a national patent office; regional office, where an applicant requests protection in one or more countries; or under the Patent Cooperation Treaty (PCT), administered by WIPO. PCT provides for the filing of a single international patent application, and the applicant can request protection in as many signatory states as needed.

Patent law is very complex, and varies from country to country. Where a patent is granted, the owner gains protection for the invention for a limited period, typically 20 years. During this time, the invention cannot be commercially made, used, distributed or sold without the owner’s consent. The owner may permit or license others to use the invention on mutually agreed terms, or sell the rights to someone else, who becomes the new owner. After this time, the invention enters the public domain and can be commercially exploited by others. Where a patent owner believes the patent has been infringed, the owner can generally go to court to stop the infringement. Third parties can also ask the court to declare the patent invalid.

The granting of new patents for agrochemicals is unsurprisingly dominated by just a few companies. This is illustrated by those granted by the European Patent Office (EPO) and USPTO (US Patent and Trademark Office) in 2012 – when 135 patents were granted to just 19 different assignees. Of these, Bayer and Syngenta led the way.

A patent has only a limited lifespan, so the inventor has a balance to strike. On one hand, a company may want to delay filing a patent application, to prolong the product’s commercial life. On the other, a company wants to patent its invention early to ensure it gains protection successfully. Any delay means there is a risk of a competitor either discovering the secret or independently coming up with the same invention and patenting it first. This is all the more likely, as companies often target research towards those areas of pesticide chemistry where products have already been successful. In extreme cases, the timing can be down to days.

Some countries require an invention to be exploited within a given time of the patent being granted. This is called working the patent. If this is not carried out, the patent holder may be required to grant a licence to another organisation to “work the invention”.

A patent covering a new aid is generally referred to as a primary patent. Where a company then gains patents for products containing this aid, or patents for new production processes, this is often called a secondary patent. Intermediate patents, process patents, formulation patents, use patents and mixture patents can all be filed after, or instead of, the initial primary patent either by the primary patent holder or by a competitor company. This can result in stalemates, with one company having the right to stop others selling a compound or combination product while...
another company can prevent others from using or producing the compound in the most effective way. These situations are usually resolved through licensing agreements – either one company agrees to forfeit its rights or both companies gain rights in different commercial or geographical sectors.

1.3 Registration

To gain registration for a pesticide, a company must usually submit a comprehensive data package to the registration authorities to back up its claims of safety and efficacy. This data will have been time consuming and expensive to generate, and this investment is protected by a period of data exclusivity. During this time, no other companies are allowed to use the data to obtain registration, unless agreed by the originator. Data exclusivity is an entirely separate and additional protection from that afforded by a patent.

The period of data exclusivity is typically ten years. During this time (and assuming the patent has expired), the generic company must provide its own data to obtain registration. This is an expensive step, and often outside the capability of smaller generics companies. The exact provisions of data exclusivity vary between countries, and this complexity adds a further barrier to a generic company wishing to enter the market.

Data compensation – after the period of data exclusivity has expired, the generic company may want to use data generated by the original registrant. In many countries, the generic company can do this provided it pays compensation to the data holder. The legislation varies worldwide, and the situation is complex.

In the EU, the agrochemical registration Regulation (1107/2009) introduced a new hurdle to register pesticides – comparative assessments. In effect, an ai will be evaluated at EU level against hazard-based cut-off criteria. Those that are not considered too hazardous will be considered for risk assessment. The European Commission is then due to establish, by 14 December 2013, a list of ais that are to be candidates for substitution, because it considers there are comparable ais that are safer for the same use.

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1.4 Factors favouring generic production

Many generic manufacturers are gearing up to produce an ai long before its patents expire. The largest generic companies invest in developing their own generic products, including formulation technologies, and so look for ais that will maximise their returns. There are certain factors that make an ai popular for generic manufacturers. These are summarised in Table 1, with the market potential being the overriding consideration for many generics companies.

1.5 Generic companies

Generic companies have various origins.

- Established as a private generic pesticide producer
- Established as a public generic pesticide producer
- Generic business developed as part of a larger chemical company
- Others, such as agricultural suppliers, cooperative groups, third-party suppliers and parallel importers

The success of the largest generics companies can be seen in Agrow’s annual ranking of the global top 20 agrochemical companies. In 2012, ChemChina subsidiary Makhteshim-Agan Industries was the world’s largest generics producer, and maintained its position as the seventh-largest agrochemical company in the Agrow rankings, with sales up by nearly 6%. Australian company Nufarm ranked eighth, posting a more modest gain of around 3%. Indian company United Phosphorus was ranked eleventh in 2012, slipping back one place on 2011. In 2006, the company became the first Indian company to enter Agrow’s top 20.

In 2012, Chinese chemical company Huapont-Nutrichem became the largest agrochemical company in China after Chongqing Huapont Pharma completed the acquisition of agrochemical exporter Nutrichem International. Huapont-Nutrichem entered Agrow’s top 20 listing at 16th place. Another Chinese company, Wynca, reappeared among the 20 leading players after a more than 30% hike in agrochemical sales, largely due to increased prices for its leading product, glyphosate. Wynca had become the first Chinese company to enter Agrow’s top 20 ranking, when it ranked 14 in 2008, on the back of high glyphosate prices. However, the fall in the price of glyphosate meant that its position was short lived.

Comparing the top generics companies in 2012 with those in 2002 (see Table 1), Makhteshim-Agan was the largest generics producer in both cases. It estimates its share of the global generic agrochemical market stands at 12%. It has around 50 subsidiaries and more than 3,000 employees. The rise of United Phosphorus, Huapont-Nutrichem and Wynca reflects the successes of the Chinese and Indian generics industry.

1.6 Strategies adopted by generics companies

Generic companies tend to compete on price, and types of formulations and mixtures. Price competition is fiercest among companies that produce only technical ais, because once the ai has met quality standards, price is one of the main differentiating factors. In addition to price, companies that develop novel formulations and mixtures can compete on the basis of effectiveness. Companies that produce branded products can build up a reputation for that brand.

Many generic pesticide companies conduct some form of research. Initially, this tends to focus on developing production processes for specific generic ais, but as companies progress to producing branded products, they often also start to develop new ai mixtures and formulations. This allows them to start competing on factors such as effectiveness and reputation with the associated business benefits.
Agrow’s New Generics 2015-2020 identifies and profiles crop protection active ingredients whose composition of matter patents will start to expire over the next five years (exact national dates depending on supplementary protection).

A profile of each active ingredient is included, grouped into herbicides, fungicides and insecticides.

Among the herbicides are foramsulfuron, oxazidomefone and penoxsulam; fungicides are the largest category, including amisulbrom, flupicolide and prothioconazole; insecticides include bistrifluron, flubendiamide and pyridalyl.

The profiles cover the essential information about each active ingredient: chemistry, formulation, patents, mode of action, crop and targets, EU and US registrations, and brands and marketing strategies. Links are provided to sources of in-depth information.

THIS REPORT FROM AGROWN WILL EXPLORE:

■ What are the crop protection active ingredients whose composition of matter patents will be expiring in the next five years?

■ What are the profiles of the active ingredients whose patents are expiring?

■ What are the brands and marketing strategies of the active ingredients whose patents are expiring?

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Generic pesticide companies generally adopt one of five broad strategies:

- Selling technical a.i.s and competing mainly on price
- Selling technical a.i.s and formulated products and competing mainly on price
- Selling technical a.i.s and branded formulated products, but still competing mainly on price
- Selling mainly branded formulated products and developing novel mixtures and formulations, and competing on effectiveness, reputation and assistance to growers
- Selling both generic and proprietary pesticide products, and competing on effectiveness, reputation and assistance to growers

Many companies move through these strategies as they develop, although progressing from one strategy to the next usually requires that the company has reached a certain size to fund the next stage in development. Each successive step offers more scope for growth but is more expensive to implement, because of the costs of developing new mixtures and formulations, and setting up a distribution network for branded products. In China, the government is encouraging consolidation to fund this.

1.7 Strategies enabling an originator to maintain market share

R&D based companies sell branded products and compete on effectiveness, reputation and assistance to growers, rather than on price. Unlike generic companies, they develop novel a.i.s, which gives them additional ways to market and differentiate their products. Typically, they market their novel a.i.s as a more effective pesticide treatment than an existing a.i., allowing this new a.i to take market share from older products. Whole classes of pesticides can be replaced by newer versions. For example, organophosphates lost share to pyrethroids and then neonicotinoids. Legislation has encouraged the removal of older a.i.s from the market.

The R&D companies have tended to focus on developed countries with more affluent agricultural industries, where farmers are willing to pay for pesticides that are more effective and can be applied at lower rates. R&D based companies with their own distribution and marketing networks are beginning to pay more attention to developing countries, especially those where the domestic pesticide market is growing. In recent years, they have begun to expand their sales networks into countries where they previously only had limited access, such as China.

As the rate of discovery of new a.i.s has fallen, so R&D companies are under more pressure than ever to squeeze the most value out of their research, even after the product patent has expired. These originating companies therefore employ various strategies to protect sales of off-patent products from generic competitors. These strategies can be very effective, and often the originator is still the main supplier long after generics enter the market. Some of the strategies followed by the R&D industry to maintain sales are shown in Table.

Even where the originating company manages to maintain a high market share, the entry of generic producers is generally a precursor to falling prices, thereby reducing revenues and profits. Where fewer generic products enter the market, the R&D company may be able to maintain higher margins, which means that manufacturers can afford to invest more in product development.

Where the market becomes flooded with a generic pesticide, leading to oversupply, the manufacturers may be forced to sell the product at a small profit over the cost of manufacturing, or even at a loss, dumping on the market and eroding prices. Ultimately, the R&D company may decide to sell its interest in the generic a.i where it thinks it no longer fits with its business model.
Leading technology
- innovative, first & only one in the world
- revolutionary, free from damage by rats
- included in country’s "Spark Program", China
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Safe & Reliable
- botanical, no harm to human beings, animals, birds, etc.
- no damage to natural enemies

Eco-friendly
- no chemicals ingredients or residues
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