Company Results
2018
**Top 20 Global Agrochemical Companies**

Welcome to Our CAC 2019 Booth (N1D05)
Venue: Shanghai New International Expo Centre, China

Wynca
Committed to become a global leader in the fields of silicon-based new materials and crop protection.

<table>
<thead>
<tr>
<th>HERBICIDE 除草剂</th>
<th>Fungicide 杀菌剂</th>
<th>CHEMICAL PRODUCT 化工品</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glyphosate</td>
<td>Carbenzadim</td>
<td>General Chemical Product</td>
</tr>
<tr>
<td>Glyphosate Isocrotonic Ammonium Salt</td>
<td>TC, SC, WG, WP</td>
<td>3,4-Dichloroaniline</td>
</tr>
<tr>
<td>Glyphosate Ammonium Salt</td>
<td>TC, SC, SG</td>
<td>1-Chloro-2-nitrobenzene</td>
</tr>
<tr>
<td>Glyphosate Potassium Salt</td>
<td>TC, SC, SG</td>
<td>O-Phenylene diamine</td>
</tr>
<tr>
<td>Glyphosate Dicyanoammonium Salt</td>
<td>TC, SL, SG</td>
<td>3,4-dichlorophenyl isocyanate</td>
</tr>
<tr>
<td>Glyphosate + Dichloroacetic Acid</td>
<td>TC, SL, SG</td>
<td>Sodium pyrophosphate</td>
</tr>
<tr>
<td>Glyphosate + 2,4-D</td>
<td>TC, SL, SG</td>
<td>3,4,5-trichloroacetanilide</td>
</tr>
<tr>
<td>Glyphosate + MCPA</td>
<td>TC, SL, SG</td>
<td>O-Dichloro-D-methyl Phosphite</td>
</tr>
<tr>
<td>Glyphosate + Glufosinate</td>
<td>TC, SL, SG</td>
<td>Phosphorus Trichloride</td>
</tr>
<tr>
<td>Glufosinate + Chlorothalonil</td>
<td>TC, SL, SG</td>
<td>Phosphorus Oxychloride</td>
</tr>
<tr>
<td>Glufosinate + Glufosinate</td>
<td>TC, SL, SG</td>
<td>Sodium tripolyphosphate</td>
</tr>
<tr>
<td>Glufosinate + 2,4-D</td>
<td>TC, SL, SG</td>
<td>Methyl chloride</td>
</tr>
<tr>
<td>Quinclorac</td>
<td>TC, SL, SG</td>
<td>Flame Retardant</td>
</tr>
<tr>
<td>Quinclorac + 2,4-D</td>
<td>TC, SL, SG</td>
<td>Tri(2-Chlorophenyl)Phosphite (TCPP)</td>
</tr>
<tr>
<td>Glufosinate-ammonium</td>
<td>TC, SL, SG</td>
<td>Tri(2-chloroethyl)phosphite (TCP)</td>
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<tr>
<td>Paraquat</td>
<td>TC, SL, SG</td>
<td>Isopropyl Triphenyl Phosphate (ITPP)</td>
</tr>
<tr>
<td>Atrazine</td>
<td>TC, SL</td>
<td>Chemical Adjuvants</td>
</tr>
<tr>
<td>Atrazine</td>
<td>TC, WG</td>
<td>Agricultural organosilicon adjuvants</td>
</tr>
<tr>
<td>Nicosulfuron</td>
<td>TC, WG</td>
<td>XHG-248 Silicone Surfactant</td>
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<tr>
<td>Clofibrate</td>
<td>TC, WG</td>
<td></td>
</tr>
<tr>
<td>Oxynil</td>
<td>TC, WG</td>
<td></td>
</tr>
<tr>
<td>Metolachlor</td>
<td>TC, WG</td>
<td></td>
</tr>
<tr>
<td>Dicamba</td>
<td>TC, WG</td>
<td></td>
</tr>
<tr>
<td>Isoproturon</td>
<td>TC, WG</td>
<td></td>
</tr>
<tr>
<td>Propasulfuron</td>
<td>TC, WG</td>
<td></td>
</tr>
<tr>
<td>Chlorpyrifos</td>
<td>TC, EC</td>
<td></td>
</tr>
<tr>
<td>Chlorpyrifos + Acetamiprid</td>
<td>TC, EC</td>
<td></td>
</tr>
<tr>
<td>Chlorpyrifos + Cypermethrin</td>
<td>TC, EC</td>
<td></td>
</tr>
<tr>
<td>Imidacloprid</td>
<td>TC, EC</td>
<td></td>
</tr>
<tr>
<td>Acetamiprid</td>
<td>TC, EC</td>
<td></td>
</tr>
<tr>
<td>Buprofezin</td>
<td>TC, EC</td>
<td></td>
</tr>
<tr>
<td>Lambda Cyhalothrin</td>
<td>TC, EC</td>
<td></td>
</tr>
<tr>
<td>Alphametrin</td>
<td>TC, EC</td>
<td></td>
</tr>
<tr>
<td>Emeamecin Benzoxate</td>
<td>TC, EC</td>
<td></td>
</tr>
<tr>
<td>Spriodifen</td>
<td>TC, EC</td>
<td></td>
</tr>
<tr>
<td>Thiamethoxam</td>
<td>TC, EC</td>
<td></td>
</tr>
<tr>
<td>Methomyl</td>
<td>TC, EC, SP</td>
<td></td>
</tr>
<tr>
<td>Carbaryl</td>
<td>TC, EC, SP</td>
<td></td>
</tr>
</tbody>
</table>

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Syngenta’s crop protection sales increased by 7.2% to $9,909 million in 2018 compared with the same period during the previous year.

Including revenues from the “controls” business, which comprises turf and landscape and professional pest management products, sales were up by 6.9% (10% at constant exchange rates) to $10,413 million. The company points out that the growth excluding divestments was 8%. Syngenta, along with ChemChina’s other subsidiary, Adama, divested a portfolio of crop protection products to Nufarm for a total agreed transaction value of $490 million, of which Syngenta’s share was $95 million.

Seed and trait sales increased by 6.3% to $3,004 million. The growth was 10% excluding the divestment of the sugar beet seeds business to DLF Seeds, the company says. Including flowers, which comprise flower seeds, cuttings and young plants, revenues were up 6.4% to $3,204 million.

Total sales for the first half, including crop protection, seeds, flowers and controls, rose by 6.9% to $13,523 million. Volumes were up 9%. Including divestments, the growth would have been 9%.

“The company delivered solid underlying sales growth of 9% compared to 2017, in a tough year where difficult weather conditions, currency and supply chain headwinds presented substantial operational challenges,” says chief executive officer Erik Fyrwald.

Earnings before interest, tax, depreciation and amortisation (EBITDA) were almost flat (+0.4%) at $2,613 million. The EBITDA margin, however, dropped by 1.3 percentage points to 19.3%. Higher product costs and adverse currency movements lowered margins by 0.8%. Divestments lowered the margin by another 0.5%.

Syngenta’s sales by business segment ($ million)

<table>
<thead>
<tr>
<th>Year ended Dec 31st</th>
<th>2017</th>
<th>% change</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop Protection</td>
<td>9,244</td>
<td>+7.2</td>
<td>9,909</td>
</tr>
<tr>
<td>Controls</td>
<td>495</td>
<td>+1.8</td>
<td>504</td>
</tr>
<tr>
<td>Seeds &amp; traits</td>
<td>2,826</td>
<td>+6.3</td>
<td>3,004</td>
</tr>
<tr>
<td>Inter-business elimination (negative)</td>
<td>[102]</td>
<td>na</td>
<td>[94]</td>
</tr>
<tr>
<td>Flowers</td>
<td>186</td>
<td>+7.5</td>
<td>200</td>
</tr>
<tr>
<td>Total¹</td>
<td>12,649</td>
<td>+6.9</td>
<td>13,523</td>
</tr>
<tr>
<td>EBITDA²</td>
<td>2,603</td>
<td>+0.4</td>
<td>2,613</td>
</tr>
</tbody>
</table>

¹ may not add up due to elimination of inter-segment sales; ² earnings before interest, tax, depreciation and amortisation.
**Product category sales**
Herbicides remained the company’s largest category, accounting for 37.1% of crop protection revenues. Sales were up 4.8% to $3,678 million. Sales of selective herbicides grew by 3.7% to $2,821 million. Non-selective products boosted revenues, rising by 8.3% to $857 million.

Fungicides made up 31.5% of crop protection sales. The category increased by 7.7% to $3,117 million.

Insecticides led sales growth, with revenues rising by 16.1% to $1,895 million, and made up 19.1% of crop protection business.

Seedcare (seed treatment business) sales grew by 6.9% to $1,129 million.

**Regional sales**
Europe, Africa and the Middle East (EAME) was the company’s largest region, accounting for 29.1% of six-month pesticide and seed sales. Total revenues were almost flat (+0.2%) at $3,877 million. Sales were down 4% at constant exchange rates (CER). The start of the season was delayed across most of Europe affecting fungicide sales and then severe drought in the summer slowed momentum, Syngenta says. The market in Ukraine was weak. Good sales growth in Seedcare, “strong” new product sales of succinate dehydrogenase inhibitor (SDHI) fungicides including Elatus (benzovindiflupyr), and sunflower seed sales in Eastern Europe helped to offset the early season impacts.

Revenue growth of 25.4% (+41% at CER) in Latin America made it Syngenta’s second-largest region, overtaking North America with sales of $3,646 million. The growth came as crop protection volumes rebounded to more normal levels after a difficult year in 2017, the company says. Crop protection sales in 2018 were 20% higher than in 2017, while seeds sales rose by 55% following the acquisition of the Argentine seed supplier, Nidera Semillas. Improved channel inventory management and new product introductions including the insecticide, Proclaim (emamectin benzoate), in Brazil and the fungicide, Orondis (DowDuPont’s oxathiapipralin 200 g/litre), in Mexico provided an excellent growth foundation. Increased acres of soybeans and cotton helped drive greater demand.

North American pesticide and seed sales inched up by 0.8% to $3,514 million. Crop protection sales were up 2%, driven by new product sales including the fungicide, Trivapro (benzovindiflupyr). Grower and channel partner adoption of digital solutions including Agridge Excelior has continued to strengthen. Seeds sales were 3% lower as a result of softer demand across the sector with fewer maize and soybean acres planted.

In Asia Pacific, recovery in South Asia helped lead an overall sales improvement for the region of 1.5% to $1,667 million. Crop protection sales increased by 1% and seeds sales increased by 6%.

Crop protection sales in China rose by 6% as farmers shifted to higher value products. Seed sales increased by 2% from a low base.

**Outlook**
“We expect that market conditions will remain challenging in 2019 and difficult farm economics will continue to weigh on sector growth, which is likely to remain at low single digit levels,” says Mr Fyrwald. He anticipates single digit growth for Syngenta in 2019 but expects to outperform the global market growth. The company points to improved performance of its seeds business with the progression of the integration of Nidera and US vegetable seed company Abbott & Cobb. The acquisition of the US satellite imagery company, FarmShots, and the Brazilian digital agriculture management firm, Strider, has improved digital capability and capacity, it adds.

**Syngenta’s crop protection sales by category ($ million)**

<table>
<thead>
<tr>
<th>Year ended Dec 31st</th>
<th>2017</th>
<th>% change</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herbicides</td>
<td>3,511</td>
<td>+4.8</td>
<td>3,678</td>
</tr>
<tr>
<td>Selective</td>
<td>2,720</td>
<td>+3.7</td>
<td>2,821</td>
</tr>
<tr>
<td>Non-selective</td>
<td>791</td>
<td>+8.3</td>
<td>857</td>
</tr>
<tr>
<td>Fungicides</td>
<td>2,895</td>
<td>+7.7</td>
<td>3,117</td>
</tr>
<tr>
<td>Insecticides</td>
<td>1,632</td>
<td>+16.1</td>
<td>1,895</td>
</tr>
<tr>
<td>Seedcare</td>
<td>1,056</td>
<td>+6.9</td>
<td>1,129</td>
</tr>
<tr>
<td>Other</td>
<td>150</td>
<td>-40.0</td>
<td>90</td>
</tr>
<tr>
<td>Total</td>
<td>9,244</td>
<td>+7.2</td>
<td>9,909</td>
</tr>
</tbody>
</table>

**Syngenta’s crop protection and seed sales by region ($ million)**

<table>
<thead>
<tr>
<th>Year ended Dec 31st</th>
<th>2017</th>
<th>% change</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe, Middle East &amp; Africa</td>
<td>3,871</td>
<td>+0.2</td>
<td>3,877</td>
</tr>
<tr>
<td>Latin America</td>
<td>2,907</td>
<td>+25.4</td>
<td>3,646</td>
</tr>
<tr>
<td>North America</td>
<td>3,487</td>
<td>+0.8</td>
<td>3,514</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>1,642</td>
<td>+1.5</td>
<td>1,667</td>
</tr>
<tr>
<td>China</td>
<td>300</td>
<td>+6.3</td>
<td>319</td>
</tr>
<tr>
<td>Other</td>
<td>256</td>
<td>+17.2</td>
<td>300</td>
</tr>
<tr>
<td>Total</td>
<td>12,463</td>
<td>+6.9</td>
<td>13,323</td>
</tr>
</tbody>
</table>
We are the largest manufacturer of triazine herbicide

Innovation R&D

Quality Assurance

Marketing Solution

Together with more than 1000 employees dedicate to our purpose: deliver better products to growers with continuous innovation and efforts.

Up to today, Zhongshan chemical has became world second largest Triazine producer next to Syngenta, our new products range expands to fungicide & insecticide include cyproconazole, pyraclostrobin & trifloxystrobin. All these efforts made us can better serve customers from almost every region of the world and support the agriculture with complete crop protection solution.

S-Metolachlor
Bentazone
Mesotrione
Florasulam
Ioxaflutole
Prothioconazole

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www.zschem.com
Bayer’s Crop Science division’s reported crop protection sales rose by 48% to €2,293 million ($2,606 million at the current rate) in the fourth quarter of 2018. On a pro forma basis, discounting changes to business from last year’s Monsanto acquisition and the divestments to BASF, sales rose by some 7.2% to €2,244 million ($2,550 million). That excludes sales of seed treatments, which are logged among “other” business along with rice and oilseed rape products. Pro forma sales are presented as if the acquisition of Monsanto and the associated divestments had already taken place as of January 1st 2017, Bayer notes.

The entire Crop Science business, including seed and trait as well as seed treatment sales, doubled (+106%) to €4,661 million, but rose by 15.4% on a portfolio and currency-adjusted basis. The division’s sales on a pro forma basis, accounting for the Monsanto acquisition and divestments to BASF rose by 3% (3.1% on an adjusted basis) to €4,511 million.

The major boost for crop protection came from sales of herbicides, which doubled to €1,172 million, up 12.3% on an adjusted basis, with the help of sales from last year’s acquisition of the Monsanto business. Pro forma business was up just 5% to €1,125 million.

Sales of fungicides were flat in reported terms at €757 million (-2% on adjusted basis). On a pro forma basis, sales dipped 0.3% (-2%) to €753 million. Insecticides sales rose by 35.8% (+34.4%) to €364 million. On a pro forma basis, sales rose by 36.6% (+35.5%) to €366 million.

**Annual sales**
Annual crop protection business rose by 26.1% on a reported basis to

Bayer’s reported crop protection sales by category (€ million)

<table>
<thead>
<tr>
<th>Year ended Dec 31st</th>
<th>2017 ($ million)^1</th>
<th>% change</th>
<th>2018 ($ million)^1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Crop protection</strong>^2</td>
<td>6,476 (7,359)</td>
<td>+26.1</td>
<td>8,163 (9,276)</td>
</tr>
<tr>
<td>Herbicides</td>
<td>2,633 (2,992)</td>
<td>+58.4</td>
<td>4,171 (4,740)</td>
</tr>
<tr>
<td>Fungicides</td>
<td>2,597 (2,951)</td>
<td>+1.9</td>
<td>2,647 (3,008)</td>
</tr>
<tr>
<td>Insecticides</td>
<td>1,246 (1,419)</td>
<td>+7.9</td>
<td>1,345 (1,528)</td>
</tr>
<tr>
<td><strong>Fourth quarter</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crop protection^2</td>
<td>1,549 (1,760)</td>
<td>+48.0</td>
<td>2,293 (2,606)</td>
</tr>
<tr>
<td>Herbicides</td>
<td>526 (598)</td>
<td>+122.8</td>
<td>1,172 (1,332)</td>
</tr>
<tr>
<td>Fungicides</td>
<td>755 (858)</td>
<td>+0.3</td>
<td>757 (860)</td>
</tr>
<tr>
<td>Insecticides</td>
<td>268 (305)</td>
<td>+35.8</td>
<td>364 (414)</td>
</tr>
</tbody>
</table>

^1 at the current rate; ^2 does not include seed treatment sales.
Bayer’s pro forma crop protection by category (€ million)

<table>
<thead>
<tr>
<th>Year ended Dec 31st</th>
<th>2017 ($ million)¹</th>
<th>% change</th>
<th>2018 ($ million)¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop protection²</td>
<td>8,949 (10,169)</td>
<td>+0.6</td>
<td>9,003 (10,230)</td>
</tr>
<tr>
<td>Herbicides</td>
<td>5,104 (5,800)</td>
<td>-1.8</td>
<td>5,014 (5,697)</td>
</tr>
<tr>
<td>Fungicides</td>
<td>2,597 (2,951)</td>
<td>+1.8</td>
<td>2,643 (3,003)</td>
</tr>
<tr>
<td>Insecticides</td>
<td>1,248 (1,418)</td>
<td>+7.9</td>
<td>1,346 (1,529)</td>
</tr>
</tbody>
</table>

Fourth quarter

| Crop protection² | 2,094 (2,379)   | +7.2     | 2,244 (2,550)   |
| Herbicides       | 1,071 (1,217)   | +5.0     | 1,125 (1,278)   |
| Fungicides       | 755 (858)       | -0.3     | 753 (856)       |
| Insecticides     | 268 (305)       | +36.6    | 366 (416)       |

¹ at the current rate; ² does not include seed treatment sales.

- €8,163 million. Pro forma sales were flat, inching up 0.6% to €9,003 million. Reported sales of the Crop Science division rose by 49% (+6.1%) to €14,266 million. On a pro forma basis, divisional sales were down 3.6% (+3.1%) to €19,332 million.

- Herbicides were up by 58.4% (+1.5%) to €4,171 million. On a pro forma basis, sales were down 1.8% (+3.8%) to €5,014 million. The segment was boosted by higher prices and improved volumes in Latin America, as well as measures “to normalise” inventory levels the previous year in Brazil. Business was slightly down in North America on poor weather conditions.

- Fungicide business was up 1.9% (+4.8%) to €2,647 million. On a pro forma basis, revenues added 1.8% (+5.3%) to €2,643 million. Sales of insecticides rose by 7.9% (+12.3%) to €1,346 million. Growth for both segments was largely attributable to the situation in Brazil in the prior year, the company says.

- Sales of “other” products, which includes seed treatments, were down, with the loss of product registrations in France the major impact. But pro forma sales were essentially flat for the year.

The Monsanto acquisition has propelled Bayer into becoming the world’s major seed company, which is underlined by reported growth of several multiples on some businesses.

Fourth quarter seed

Fourth-quarter seed and trait sales were up ten-fold at €3,637 million on the back of the acquired businesses. However, on a pro forma basis, sales were down by 2.3% at €1,778 million.

- Pro forma sales of maize seed and traits were 1.4% higher (+1.7%) at €1,036 million. For soybeans, pro forma business slid 5.7% (-1%) to €651 million, while the vegetable seed business lost 15% (-15.3%) on the same basis to €91 million.

Annual seed sales

Annual seed and trait sales quadrupled in reported terms. Nevertheless, the company posted a pro forma fall of 6.4% at €7,919 million.

- Maize sales were down on a pro forma basis by 4.7% (+3.9%) at €4,871 million. Maize sales were boosted by shifts in sales from the previous year in North America due to later purchasing, and to a special effect in Latin America and the associated licence revenues in Brazil. Pro forma soybean sales fell 10.1% (-0.5%) to €2,378 million. The adjusted flat sales for soybean traits came despite a decline in North America on a slightly decreased market share and lower acreages. By contrast, business was up in Latin America, mainly due to increased plantings and higher market penetration by legacy company Monsanto’s genetically modified insect-resistant and herbicide-tolerant Intacta RR2 Pro technology. Sales of vegetable seeds were down 5.1% (-0.7%) at €670 million.

Crop Science

Reported Crop Science business doubled for the fourth quarter and rose by 15% on an adjusted basis, while the pro forma rise was of just 3% (+3.1%) to €4,511 million. Fourth-quarter volumes were up 14.2%, while price rises and currency effects added 1.2% and 1.3%, respectively, to the top line figures. Portfolio effects added 89.3%.

- Maize sales were boosted by shifts in sales from the previous year in North America due to later purchasing, and to a special effect in Latin America and the associated licence revenues in Brazil. Pro forma soybean sales fell 10.1% (-0.5%) to €2,378 million. The adjusted flat sales for soybean traits came despite a decline in North America on a slightly decreased market share and lower acreages. By contrast, business was up in Latin America, mainly due to increased plantings and higher market penetration by legacy company Monsanto’s genetically modified insect-resistant and herbicide-tolerant Intacta RR2 Pro technology. Sales of vegetable seeds were down 5.1% (-0.7%) at €670 million.

Seed, seed treatment and non-crop pesticide reported sales (€ million)

<table>
<thead>
<tr>
<th>Year ended Dec 31st</th>
<th>2017 ($ million)¹</th>
<th>% change</th>
<th>2018 ($ million)¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed²</td>
<td>731 (831)</td>
<td>+397.5</td>
<td>3,637 (4,133)</td>
</tr>
<tr>
<td>Maize seed and trait</td>
<td>87 (99)</td>
<td>+1,978</td>
<td>1,808 (2,054)</td>
</tr>
<tr>
<td>Soybean seed and trait</td>
<td>210 (239)</td>
<td>+471.4</td>
<td>1,200 (1,364)</td>
</tr>
<tr>
<td>Vegetable seed</td>
<td>434 (493)</td>
<td>+44.9</td>
<td>629 (715)</td>
</tr>
<tr>
<td>Environmental Science</td>
<td>671 (762)</td>
<td>+9.1</td>
<td>732 (832)</td>
</tr>
<tr>
<td>Other³</td>
<td>1,699 (1,931)</td>
<td>+2.1</td>
<td>1,734 (1,970)</td>
</tr>
</tbody>
</table>

Fourth quarter

| Seed²               | 163 (185)        | +960.7   | 1,729 (1,965)    |
| Maize seed and trait| 4 (5)            | -        | 1,036 (1,177)    |
| Soybean seed and trait| 57 (65)         | +956.1   | 602 (684)        |
| Vegetable seed      | 102 (116)        | -10.8    | 91 (103)         |
| Environmental Science| 183 (208)       | +25.1    | 229 (260)        |
| Other³              | 368 (418)        | +11.4    | 410 (466)        |

¹ at the current rate; ² does not include oilseed rape and vegetable seed businesses; ³ includes seed treatments as well as oilseed rape and vegetable seed businesses.
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For the full-year, sales fell by 3.6% (+3.1%) on a pro forma basis to €19,332 million. Volumes added 5.9% to the reported top line, prices just 0.2%, while currency effects shaved 4.3%. Portfolio changes added 47.2%.

That included sales from the Environmental Science business. Pro forma sales of the latter rose by 5.6% (+4.3%) in the fourth quarter, and fell by 8.3% (-3%) for the whole year.

Fourth-quarter earnings before interest, tax, depreciation and amortisation (EBITDA) rose by 78.6% before special items to €543 million. After special items, EBITDA turned negative to €441 million. The margin before special items dropped from 13.4% to 11.6%. EBIT for the quarter fell by 76.7% before special items to €51 million, and turned deeply negative (-€934 million) after special items.

EBITDA before special items for the year advanced by 29.8% to €2,651 million. After special items, it more than doubled. The rise was primarily due to the earnings contribution from the newly acquired business (€705 million) and the recognition in the second quarter of 2017 of significantly higher provisions for product returns in Brazil, Bayer notes. By contrast, earnings were diminished by the divestment to BASF, a decrease in volumes in Europe and a negative currency effect of €101 million (excluding the acquired business). The margin fell from 21.3% to 18.6%. EBIT for the year fell 21.1% before special items to €1,297 million. After special items, it more than doubled to €3,138 million.

**Regions**

In the North America region, Bayer posted a 75.4% currency-adjusted rise in sales to €4,696 million.

The portfolio effect was €1,881 million. On a portfolio and currency-adjusted basis, the increase was 7.5%. That come from sales generated by the service agreements with BASF in connection with the divested SeedGrowth or seed treatment business, and to strong growth of the subsequently divested canola seed business in Canada in the first half. Bayer notes “encouraging” sales gains in fungicides, in part due to product launches.

Sales in Latin America doubled on a currency-adjusted basis to €4,023 million, with the portfolio effect amounting to €1,844 million. Adjusting for that, sales were up 17.1%. The rise follows significantly higher provisions recognised for product returns and of lower sales of crop protection products due to high inventory levels in Brazil the previous year, Bayer notes. The company “successfully” took measures to “normalise” inventories of crop protection products by the end of the season, in the second quarter. Excluding Brazil, sales were slightly down elsewhere in Latin America.

---

<table>
<thead>
<tr>
<th>Year ended Dec 31st</th>
<th>2017 ($ million)¹</th>
<th>% change</th>
<th>2018 ($ million)¹</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Seed</strong>³</td>
<td>8,463 (9,617)</td>
<td>-6.4</td>
<td>7,919 (8,998)</td>
</tr>
<tr>
<td>Maize seed and trait</td>
<td>5,112 (5,809)</td>
<td>-4.7</td>
<td>4,871 (5,535)</td>
</tr>
<tr>
<td>Soybean seed and trait</td>
<td>2,645 (3,006)</td>
<td>-10.1</td>
<td>2,378 (2,702)</td>
</tr>
<tr>
<td>Vegetable seed</td>
<td>706 (802)</td>
<td>-5.1</td>
<td>670 (761)</td>
</tr>
<tr>
<td><strong>Environmental Science</strong></td>
<td>1,041 (1,183)</td>
<td>-8.3</td>
<td>955 (1,085)</td>
</tr>
<tr>
<td><strong>Other</strong>³</td>
<td>1,610 (1,829)</td>
<td>-9.6</td>
<td>1,455 (1,653)</td>
</tr>
</tbody>
</table>

**Fourth quarter**

| **Seed**³ | 1,819 (2,067) | -2.3 | 1,778 (2,020) |
| Maize seed and trait | 1,022 (1,161) | +1.4 | 1,036 (1,177) |
| Soybean seed and trait | 690 (784) | -5.7 | 651 (740) |
| Vegetable seed | 107 (122) | -15.0 | 91 (103) |
| **Environmental Science** | 216 (245) | +5.6 | 228 (259) |
| **Other**³ | 250 (284) | +4.4 | 261 (296) |

¹ at the current rate; ³ does not include oilseed rape and vegetable seed businesses; ³ includes seed treatments as well as oilseed rape and vegetable seed businesses.

---

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- Cyromazine 60%
- Diazinon 95%
- Fipronil 96%
- Emetedinc benzate 90%
- Glypheate 66%
- Kasugamycin 85%
- Ternaphos 60%

**Formulation**

- Emetedinc benzate 5% WDG
- Hexaconazole 10% GC
- Imitacloprid 20% SL
- Difenconazole 250 g/l EC
- Dinamorph + Cyxamex 35% SC
- Azoxystrobin + Chlorothalonil 480 g/l SC
- Kasugamycin + Tricyloazide 13% WP
- Tebuconazole + Emetedinc benzate 34% WP

- *

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---
Sales for the division in Bayer’s Europe/ Middle East/Africa region rose by 13.7% on a currency-adjusted basis to €3,689 million. There was a portfolio effect of €557 million. On a currency- and portfolio-adjusted basis, sales fell by 3.0%. The SeedGrowth business, in the “other business” segment, saw a decline due to the loss of registrations in France. Fungicides and herbicides were also “slightly” lower, primarily due to unfavourable weather conditions in central and western Europe.

Currency-adjusted sales in the Asia Pacific region were up 25% to €1,858 million with portfolio effects amounting to €238 million. Revenues rose 9.7% adjusted for portfolio changes. Gains came across all business units, with Bayer highlighting particular strength in crop protection. Growth was “particularly strong” in China, Japan, India and South-East Asia.

Bayer notes that global crop protection and seed markets rose by 2% last year. Volume demand was particularly strong for seed, it notes. Particularly strong geographically were Latin America, with inventory levels “normalising” in Brazil after a previous glut of products, as well as Asia Pacific and North America. Europe stagnated on a hot summer.

**US glyphosate lawsuits**

Bayer was facing some 11,200 plaintiffs in the US over claims of a cancer link to legacy company Monsanto’s glyphosate herbicide-based products, as of January 28th. Last year, a plaintiff won damages after Monsanto had been found liable for not warning that use of its Roundup (glyphosate) products risked causing cancer. The punitive damages were later reduced but remained substantial at $39 million. A federal judge in California has recently rejected Bayer’s latest bid to derail hundreds of lawsuits filed by cancer victims who make similar allegations over its glyphosate-based herbicides. Seven court proceedings are scheduled for this year. The company says that it has “science on our side and will continue to vigorously defend this important and safe herbicide”.

**Outlook**

The company expects the markets to grow by 3% this year. Bayer sees its sales rising by around 4% this year on a currency and portfolio-adjusted basis. It anticipates an EBITDA margin before special items of some 25%.

Bayer notes that its credit ratings fell on the Monsanto acquisition and the build up of debts to pay for it. The company cites two agencies rating it as stable, and a third as negative. Bayer says the grades reflect the company’s “high solvency and ensure access to a broad investor base”.

---

**Bayer Crop Science division results (€ million)**

<table>
<thead>
<tr>
<th>Year ended Dec 31st</th>
<th>2017 ($ million)(^1)</th>
<th>% change</th>
<th>2018 ($ million)(^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total sales</td>
<td>9,577 (10,882)</td>
<td>+49.0</td>
<td>14,266 (16,210)</td>
</tr>
<tr>
<td>Pro forma sales</td>
<td>20,603 (23,411)</td>
<td>-3.6</td>
<td>19,332 (21,967)</td>
</tr>
<tr>
<td>EBITDA(^2)</td>
<td>1,716 (1,950)</td>
<td>+162.2</td>
<td>4,500 (5,113)</td>
</tr>
<tr>
<td>EBIT(^3)</td>
<td>1,235 (1,403)</td>
<td>+154.1</td>
<td>3,138 (3,566)</td>
</tr>
</tbody>
</table>

**Fourth quarter**

| Total sales         | 2,263 (2,571)         | +106.0   | 4,661 (5,296)          |
| Pro forma sales     | 4,379 (4,976)         | +3.0     | 4,511 (5,126)          |
| EBITDA\(^2\) (loss) | 193 (219)             | -        | [441 (501)]            |
| EBIT\(^3\)          | 64 (73)               | -        | [934 (1,061)]          |

\(^1\) at the current rate; \(^2\) earnings before interest, tax, depreciation and amortisation; \(^3\) earnings before interest and tax.
DowDuPont’s crop protection sales rose by 5.6% to $1,618 million in the fourth quarter of 2018. Strong volumes resulted in organic growth of 10%, the company points out. Growth was led by product launches including picoxystrobin-based fungicides in Latin America, as well as pasture and land management herbicides and 2,4-D-based Enlist herbicides. Gains were partly offset by a weather-related reduction in demand for nitrogen stabilisers. Higher prices were offset by currency pressures, primarily in Latin America.

Seed sales fell by 4.5% to $1,199 million. However, organic sales were up by 8%. Strong volume growth reflected the start of a recovery from the sale of part of Dow AgroSciences’ Brazilian seed business in late 2017, an early start to the safrinha season in Latin America and the timing of seed shipments in the US and Canada. The negative portfolio impact reflected the inclusion of two months of the Brazilian maize business in the prior year’s quarter.

DowDuPont’s agriculture business, Corteva Agriscience, recorded a 1.1% increase in revenues to $2,817 million. Volumes and prices rose by 4% and 5%, respectively, partly offset by an adverse currency impact of 5% and a 3% decline due to the Brazilian maize seed divestment.

Operating earnings before interest, tax, depreciation and amortisation (EBITDA) rose by 4.5% to $233 million. That reflected sales gains, cost synergies and a $14 million gain from the divestment of certain product lines, partly offset by higher raw material costs, investments and commissions.

Full year
Full-year agricultural product sales were basically flat, falling by 0.3% to $14,301 million. Organic growth of 1% was offset by a portfolio impact. Local price and product mix gains of 3% were offset by a 2% volume decline and a 1% decline from portfolio and other factors.

DowDuPont expects its agricultural product sales to be down by a low single-digit percentage in the first quarter of 2019 due to timing impacts, with operating EBITDA down by a similar percentage. First-half sales are forecast to decline at a similar rate due to adverse currency effects. The company expects a $350 million hit on sales and $100 million on operating EBITDA, with the most significant impacts in Brazil. Excluding currency, the company forecasts a low single-digit percentage increase, driven by new products. First-half operating EBITDA is expected to be flat, with sales gains and cost synergies being offset by currency pressures, higher input costs and growth investments.
CROP PROTECTION

Herbicides
- Glyphosate
- Ethofumesate
- Phenmedipham
- Desmedipham
- Metamitron
- Penoxsulam
- Florasulam
- Mesotrione
- Amicarbazone
- S-metolachlor
- Glufosinate-ammonium
- Mesosulfuron-methyl
- Carbentrazone

Insecticides
- MCPA
- 2,4-D
- Dicamba
- Triclopyr
- Trifluralin
- Ametryn
- Prometryn
- Atrazine
- Simazine
- Metaldehyde
- Dinotefuran
- Indoxacarb
- Difenthiuron
- Fosthiazate
- Spirodiclofen
- Methoxyfenozide
- Thiamethoxam
- Pyrimethanil
- Phoxim
- Malathion
- Triazophos

Fungicides
- Metalaxyl
- Pyraclostrobin
- Tebuconazole
- Azoxystrobin
- Thiophanate
- Hexaconazole
- Pyrimethanil
- Myclobutanil
- Prothioconazole

Biofungicides
- Shengjinmycin
- Bacillus cereus+Validamycin

CROP NUTRITION

Base Fertilizers
Foliar Fertilizers
Humic acid liquid fertilizers
Water Soluble Fertilizers
Decomposer of organic matters
High end comprehensive water soluble calcium
Microbial Inoculant & Microorganism Fertilizers

Biostimulant
- Streptomyces fradiae
- Beautiful Streptomyces
- Paenibacillus Polymyxa
- Mario
- 5-ALA
BASF recorded a rise of 2.8% in agrachemical sales in 2018 to €5,856 million ($6,654 million at the current rate). The company recorded seed and trait sales of €300 million, a new business segment in 2018, following the acquisition of assets from Bayer’s Crop Science division in August last year.

Total annual revenues of the company’s Agricultural Solutions business also comprising seed and traits grew by 8.1% to €6,156 million. A portfolio advantage of 10% combined with a 4% price increase and a 1% increase in volumes more than offset the 7% negative currency impact.

Earnings before interest and tax (EBIT) before special items was down by 28.9% to €734 million. The decline was attributable to negative currency effects in all regions, as well as the “strongly” negative contribution from the acquired businesses due to the late, intra-year timing of the transaction, the seasonality of the seeds business, which primarily generates income in the first half of the year, as well as costs for integrating the businesses into BASF, the company says. EBIT decreased by 41.8% to €591 million. The special items primarily arose from the acquisition, BASF points out.

Fourth quarter
Combined agrachemical and seed revenues for the fourth quarter shot up by 26.8% to €1,684 million. EBIT for the quarter was negative with the company posting an operating loss of €46 million. Herbicides were the company’s largest category, accounting for 41.6% of annual agrachemical sale. The category grew by 2.7% during the year to €2,436 million. Fungicides made up 39.1% of crop protection revenues. But the category declined by 3% to €2,287 million.

BASF’s crop protection results (€ million)

<table>
<thead>
<tr>
<th>Year ended Dec 31st</th>
<th>2017 ($ million)1</th>
<th>% change</th>
<th>2018 ($ million)2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>5,696 (6,472)</td>
<td>+8.1</td>
<td>6,156 (6,995)</td>
</tr>
<tr>
<td>Agchems</td>
<td>5,696 (6,472)</td>
<td>+2.8</td>
<td>5,856 (6,654)</td>
</tr>
<tr>
<td>EBITDA2</td>
<td>1,282 (1,457)</td>
<td>-23.2</td>
<td>985 (1,119)</td>
</tr>
<tr>
<td>EBIT3 before special items</td>
<td>1,033 (1,174)</td>
<td>-28.9</td>
<td>734 (834)</td>
</tr>
<tr>
<td>EBIT3</td>
<td>1,015 (1,153)</td>
<td>-41.8</td>
<td>591 (672)</td>
</tr>
<tr>
<td><strong>Fourth quarter</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sales</td>
<td>1,328 (1,509)</td>
<td>+26.8</td>
<td>1,684 (1,914)</td>
</tr>
<tr>
<td>EBITDA2</td>
<td>266 (302)</td>
<td>-60.9</td>
<td>104 (118)</td>
</tr>
<tr>
<td>EBIT3 before special items</td>
<td>207 (235)</td>
<td>-81.6</td>
<td>38 (43)</td>
</tr>
<tr>
<td>EBIT3</td>
<td>194 (220)</td>
<td>na</td>
<td>(46) (52)</td>
</tr>
</tbody>
</table>

1 at the current rate; 2 earnings before interest, tax, depreciation and amortisation; 3 earnings before interest and tax.
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Europe made up a third of total sales. Revenues from the region were up by 2% to €2,022 million. This was attributable to the acquired businesses and higher sales volumes in almost all indications, despite the extreme weather conditions and long dry period. Sales development was dampened by negative currency effects, particularly in eastern Europe and Turkey.

The company’s South America/Africa/Middle East business region led growth, with revenues increasing by 17.3% to €1,323 million. The increase was largely driven by a higher price level and the contribution of the acquired businesses. Especially for fungicides in Brazil, sales volumes increased “considerably”. Negative currency effects had an offsetting impact.

Sales in Asia grew by 10.8% to €645 million. BASF achieved volumes growth in all indications, particularly fungicides. The acquired businesses and a higher price level also contributed to the sales increase. Negative currency effects reduced sales development “considerably”.

### BASF’s sales by category (€ million)

<table>
<thead>
<tr>
<th>Year ended Dec 31st</th>
<th>2017 ($ million)</th>
<th>% change</th>
<th>2018 ($ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herbicides</td>
<td>2,371 (2,694)</td>
<td>+2.7</td>
<td>2,436 (2,768)</td>
</tr>
<tr>
<td>Fungicides</td>
<td>2,357 (2,678)</td>
<td>-3.0</td>
<td>2,287 (2,599)</td>
</tr>
<tr>
<td>Insecticides</td>
<td>663 (753)</td>
<td>+1.1</td>
<td>670 (761)</td>
</tr>
<tr>
<td>Functional Crop Care</td>
<td>305 (347)</td>
<td>+51.8</td>
<td>463 (526)</td>
</tr>
<tr>
<td><strong>Total agchems</strong></td>
<td><strong>5,696 (6,472)</strong></td>
<td><strong>+2.8</strong></td>
<td><strong>5,856 (6,654)</strong></td>
</tr>
<tr>
<td>Seed and traits</td>
<td>-</td>
<td>na</td>
<td>300 (341)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5,696 (6,472)</strong></td>
<td><strong>+8.1</strong></td>
<td><strong>6,156 (6,995)</strong></td>
</tr>
</tbody>
</table>

1 at the current rate.

### BASF’s sales by region (€ million)

<table>
<thead>
<tr>
<th>Year ended Dec 31st</th>
<th>2017 ($ million)</th>
<th>% change</th>
<th>2018 ($ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>2,003 (2,276)</td>
<td>+8.1</td>
<td>2,166 (2,461)</td>
</tr>
<tr>
<td>Europe</td>
<td>1,983 (2,253)</td>
<td>+2.0</td>
<td>2,022 (2,298)</td>
</tr>
<tr>
<td>South America, Africa &amp; Middle East</td>
<td>1,128 (1,282)</td>
<td>+17.3</td>
<td>1,323 (1,503)</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>582 (661)</td>
<td>+10.8</td>
<td>645 (733)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5,696 (6,472)</strong></td>
<td><strong>+8.1</strong></td>
<td><strong>6,156 (6,995)</strong></td>
</tr>
</tbody>
</table>

1 at the current rate.
**Agrow Biopesticides 2019**

**Company Profiles | Product Portfolios | Patents | Formulations | R&D | Regulatory Frameworks | Future Market Trends | Product Developments**

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- Recent patent applications

We are pleased to bring you our fully updated and revised report, which summarises crop protection by biological agents. The main focus of this essential report is the control of pests and diseases by products based on microorganisms - Biopesticides.

Comprehensive details of biofungicides, bioinsecticides, bionematicides and bioherbicides are included within.

The difficulty in finding novel chemical active ingredients and the favourable environmental profile is driving development of this important sector. There is now improved understanding regarding the use of biological products, particularly in integrated pest management systems.

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- Clethodim, 37% TK, 240 g/L EC
- Dicamba + Glyphosate, 40% SL
- Ethoxy sulfuron 10% + Penoxsulam 20% WDG
- Ethoxy sulfuron, 95% TC, 15% WDG
- Glufosinate, 95% TC, 200 g/L SL
- Glyphosate, 96% TC, 41% AS
- Mefenacet 60% + Ethoxy sulfuron 10% WDG
- Metamitron 98% TC, 700SC, 75% WDG
- Metsulfuron-methyl, 98% TC, 60% DF

**Picloram TC**

**Rimsulfuron, 98% TC, 25% WDG**

### Fungicides

- Carbendazim, 500 g/L SC, 98% TC
- Chlorothalonil 40% + Thiophanate-methyl 35% WP
- Difenoconazole 15% + Azoxytribin 15% SC
- Iprenfos, 95% TC, 50% EC, 50% EW
- Picoxystrobin 20% + Propiconazole 10% SE
- Picoxystrobin 20% + Tebuconazole 10% SC
- Picoxystrobin, 98% TC, 95% TC
- Propiconazole, 98% TC, 41.8 EC
- Tebuconazole 20% + Azoxytribin 10% SC
- Tebuconazole, 98% TC, 430g/L SC

### Plant Growth Regulators

- 4-Indol-3-ylbutyric acid 0.85% + 1-Naphthyl acetic acid 0.2% AS
- Cyanamide, 50% AS
- Forchlorfenuron, 98.0% TC, 0.8% SL
- Paclorbutrazol, 98% TC, 240g/L SC

### Insecticides

- Abamectin, 98% TC, 1.8% EC
- Acephate, 97% TC, 90% SG
- Buprofezin, 25% WP

### Bacillus Subtilis

- Bacillus subtilis, $1 \times 10^{10}$ CFU/g WP, $8 \times 10^{8}$ CFU/g SC
The acquisition of certain crop protection assets from DuPont (part of DowDuPont) boosted FMC’s agrochemical sales by 26.9% to $1,099.4 million in the fourth quarter of 2018. FMC acquired the business on November 1st 2017. On a pro forma basis, sales were up by 23%, excluding an estimated 5% adverse currency effect factor. “This was significantly above the market and our key competitors, as we continue to capitalise on the strength of our broad portfolio and capture new sales synergies,” says FMC’s chairman and CEO, Pierre Brondeau. Last week, FMC pointed to an 18% sales rise (including the currency impact) for the business, with increased demand across all regions.

In Latin America, pro forma sales rose by 27% to $473 million. That was due to “robust” sales to cotton and soybean growers and growth in the wheat area in Argentina. Increased prices in Brazil more than offset adverse currency effects, the company points out.

North American business was up by 21% to $249 million. There was strong demand for pre-emergence herbicides and insecticides, with the sulfentrazone-based herbicide, Authority Supreme, gaining “significant traction” in the soybean sector.

Sales in Asia grew by 4% to $238 million. There were strong sales in the rice, fruit and vegetable sectors in Pakistan but adverse weather conditions persisted in Australia. Excluding the effects of restructuring and anti-trust remedies in India, pro forma sales were up by 14%.

In the Europe, Africa and Middle East region, revenues rose by 13% to $140 million. France, Germany and Russia combined showed a pro forma sales rise of 45%.

Earnings before interest, tax, depreciation and amortisation (EBITDA) grew by 35% to $301.7 million. That was $13 million above the mid-point of guidance in November 2018 due to stronger-than-expected revenue growth.

**Full year**
The DuPont business purchase boosted full-year sales by 69.3% to $4,285.3 million. On a pro forma basis, annual revenues rose by 11%, or by 13% if a 2% adverse currency effect is excluded.

EBITDA more than doubled (+111.4%) to $1,217.8 million, with the EBITDA margin gaining 5.6 percentage points to 28.4%.

**Outlook**
With the final separation of FMC’s lithium business scheduled for March 1st, the company presents itself as an agricultural sciences company for this year. Excluding the lithium business, first-quarter sales are forecast to reach $1,180-1,210 million, representing growth of 8% (or 14% if currency effects are excluded) at the mid-point of this range. Adjusted EBITDA is likely to be flat at $320-340 million. Cost and foreign currency effects are strongest in the first quarter, FMC points out. For the full year, the company forecasts revenues of $4,450-4,550 million, or growth of 5% (8%) at the mid-point. Adjusted EBITDA is expected to rise by some 7% to $1,650-1,705 million. Adverse foreign currency effects should abate during the second half of the year.

### FMC’s Agricultural Solutions results ($ million)

<table>
<thead>
<tr>
<th>Year ended Dec 31st</th>
<th>2017</th>
<th>% change</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>2,531.2</td>
<td>+69.3</td>
<td>4,285.3</td>
</tr>
<tr>
<td>EBITDA¹</td>
<td>576.1</td>
<td>+111.4</td>
<td>1,217.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fourth quarter</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>866.2</td>
<td>+26.9</td>
<td>1,099.4</td>
</tr>
<tr>
<td>EBITDA¹</td>
<td>223.4</td>
<td>+35.0</td>
<td>301.7</td>
</tr>
</tbody>
</table>

¹ earnings before interest, tax, depreciation and amortisation.
# LIER PRODUCT

## The largest Glufosinate-ammonium manufacturer of China

### HERBICIDE

- Glufosinate - ammonium
- Flumioxazin
- Clodinafop-propargyl
- Picloram
- Clopyralid
- Fluroxypyr-mep.1
- Triclopyr-acid
- Triclopyr-butotyl
- Diquat
- Pinoxaden
- Flufenacet
- Diflufenican
- Mefenacet
- Oxadiazon

### SAFENER

- Diuron
- Fluometuron
- Chlorotoluron
- Linuron
- Propyzamide
- Cyclanilide
- Isoproturon
- Tebuetiuron
- Bensulfuron-methyl
- Pyrazosulfuron-ethyl
- Nicosulfuron
- Quinclorac
- Napropamide
- Cloquintocet-mexyl
- Isoxadifen-ethyl

### FUNGICIDE

- Epoxiconazole
- Difenconazole
- Iprodione

### INSECTICIDE

- Pyriproxyfen

---

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Postcode: 610052
E-mail: rhett@lierchem.com

[www.lierchem.com](http://www.lierchem.com)
UPL recorded a sales rise of 18.4% to Rs 47,530 million ($667 million at the current rate) for its “agro activities” business comprising agrochemicals and seeds in its third quarter ended December 31st. Agro activities made up 96.6% of consolidated quarterly sales, which went up by 17.3% to Rs 49,210 million ($691 million). Agrochemicals accounted for 89.4% of the company’s consolidated gross revenues for its fiscal year ended March 31st 2018.

A volume increase of 6% combined with a price rise of 7% and a positive 5% currency effect provided the growth. Consolidated international sales contributed 90.1% to quarterly business and increased by 23.9% to Rs 44,350 million. Domestic sales, however, declined by 20.8% to Rs 4,860 million.

Earnings before interest, tax, depreciation and amortisation (EBITDA) on total sales for the quarter rose by 22.6% to Rs 10,160 million. Profit after tax dipped by 1.1% to Rs 5,630 million. The decline was because of the tax provision including excess provision of tax written back and minimum alternative tax credit entitlement relating

### UPL’s results (Rs million)

<table>
<thead>
<tr>
<th>3rd qtr ended Dec 31st</th>
<th>2017 ($ million)$</th>
<th>% change</th>
<th>2018 ($ million)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>41,940 (589)</td>
<td>+17.3</td>
<td>49,210 (691)</td>
</tr>
<tr>
<td>Domestic</td>
<td>6,140 (86)</td>
<td>-20.8</td>
<td>4,860 (68)</td>
</tr>
<tr>
<td>International</td>
<td>35,800 (503)</td>
<td>+23.9</td>
<td>44,350 (623)</td>
</tr>
<tr>
<td>Agro activities$\text{2}$</td>
<td>40,150 (564)</td>
<td>+18.4</td>
<td>47,530 (667)</td>
</tr>
<tr>
<td>EBITDA$\text{3,4}$</td>
<td>8,290 (116)</td>
<td>+22.6</td>
<td>10,160 (143)</td>
</tr>
<tr>
<td>Profit after tax$\text{3}$</td>
<td>5,690 (80)</td>
<td>-1.1</td>
<td>5,630 (79)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nine months</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>116,870 (1,641)</td>
<td>+13.9</td>
<td>133,120 (1,869)</td>
</tr>
<tr>
<td>Domestic</td>
<td>27,290 (383)</td>
<td>+3.0</td>
<td>28,110 (395)</td>
</tr>
<tr>
<td>International</td>
<td>89,580 (1,258)</td>
<td>+17.2</td>
<td>105,010 (1,474)</td>
</tr>
<tr>
<td>Agro activities$\text{2}$</td>
<td>113,560 (1,594)</td>
<td>+13.3</td>
<td>128,630 (1,806)</td>
</tr>
<tr>
<td>EBITDA$\text{3,4}$</td>
<td>22,980 (323)</td>
<td>+17.6</td>
<td>27,020 (379)</td>
</tr>
<tr>
<td>Profit after tax$\text{3}$</td>
<td>14,070 (198)</td>
<td>+1.1</td>
<td>14,220 (200)</td>
</tr>
</tbody>
</table>

$^{1}$ at the current rate; $^{2}$ includes agrochemicals and seeds; $^{3}$ includes on non-agrochemical sales; $^{4}$ earnings before interest, tax, depreciation and amortisation.
KING TECH CORPORATION

Professional Manufacturer
And Exporter in Agrochemicals

PRODUCT LIST

INSECTICIDES
ABAMECTIN
ACETAMIPRID
CARBAZYL
CARBOFURAN
CHLORPYRIFOS
EMAMECTIN
BENOATE
FLUFENOXURON
HEXythIAZOX
IMIDACLOPRID
LAMBDACYL
CYHALOTHRIN
LUFENURON
NITENPYRAM
NOVALURON
SPIRODICLOCIFEN
THIAMETHOXAM
PYRAZOLOSTROBIN
FIPRONIL
BIFENTHRIN
PYRETHROZINE
PYRIFLUXOXIFEN

HERBICIDES
CYPROCONAZOLE
DIFENOCONAZOLE
FLUDIOXONIL
FOSETYL-ALUMINIUM
IPRODIONE
MANCOZEB
METAXYL
PROPICONAZOLE
SPIROXAMINE
TEBUCONAZOLE
TRICYCLAZOLE
TRIFLUXOSTROBIN
GLUFOSINATE AMMONIUM
METAZACHLOR
METSULFURON-METHYL
OXYFLUORFEN
PARAQUAT
PROANIL
PYRAZOSULFURON-ETHYL
QUINCLORAC
FLUMioxAZIN
FLORASULAM

REGULATORS
BRASSINOLIDE
GIBBERELLIC ACID
PACLOBUTRAZOL

RODENTICIDES
ALUMINUM PHOSPHIDE
BRODIFACOUM
BROMADIOLONE

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TEL: +86-755-25195648 25195646 25195670 25195671 25195411 25194828
FAX: +86-755-25195613
http://www.kingtech.com E-mail: vicki.cheng@kingtech.com
PLEASE CONTACT: MS VICKI CHENG
to earlier periods of Rs 980 million and Rs 550 million of reduction in deferred tax asset due to US tax reforms, the company says. After adjusting these figures, the tax provision would be Rs 290 million, resulting in 7% growth.

**Nine months**
Following the 10.5% rise in “agro” revenues during the first six months, nine-month agro sales increased by 13.3% to Rs 128,630 million. They made up 96.6% of consolidated revenues, which rose by 13.9% to Rs 133,120 million.

The revenue growth was a result of a 7% increase in volumes combined with a price rise of 4% and a positive 3% currency effect. Consolidated international sales contributed 78.9% to quarterly business and increased by 17.2% to Rs 105,010 million. Domestic sales grew by 3% to Rs 28,110 million.

**Regional sales**
Latin America was UPL’s largest region during the third quarter, accounting for 46.6% of consolidated revenues. The region also led growth, with sales rising by over a quarter (+26.5%) to Rs 22,840 million. UPL says that the new government has led to stabilisation of the Brazilian real, thereby improving market sentiment. It says that “overall”, the market in Brazil grew by 18%. The company also highlights the successful launch and acceptance of the herbicide, Strim (S-metolachlor) in Argentina and the Southern Cone region.

Consolidated quarterly sales in North America grew by 21.5% to Rs 8,660 million. Sales of the herbicide, Lifeline (glufosinate-ammonium), continued to grow despite an increase in acreage of planted dicamba-tolerant seeds, UPL says.

In Europe, consolidated quarterly revenues rose by over a third (+36.6%) to Rs 5,110 million. The company points out that it “continued to grow” in Europe despite the market going down by 10%. Sales were strong especially for the fungicide, mancozeb, in France and technical active ingredient sales of the plant growth regulator, metamitron, in Russia. “Better planning of [market access for] metamitron” led to improved volumes in spite of drop in sugarbeet acreages, UPL says.

UPL’s domestic market, India, witnessed revenue decline of 20.8% to Rs 4,860 million. Inconsistency in rainfall resulted in a decline in the market, UPL says. It adds that the government decision to restrict or ban use of organophosphorus compounds in several states impacted sales.

Quarterly sales in the rest of the world moved up by 12.7% to Rs 7,740 million. The herbicide, Tarang (glufosinate-ammonium), was well accepted in Indonesia, Philippines and Vietnam, which led to strong volume growth, UPL says. It points to “significant growth” of the insecticide, Ulala (flonicamid) in Pakistan.

**Arysta acquisition**
UPL completed the acquisition of Platform Specialty Products’ agrochemical business, Arysta LifeScience, last week.

---

**UPL’s consolidated sales** by region (Rs million)

<table>
<thead>
<tr>
<th>3rd qtr ended Dec 31st</th>
<th>2017 ($ million)¹</th>
<th>% change</th>
<th>2018 ($ million)²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latin America</td>
<td>18,060 (254)</td>
<td>+26.5</td>
<td>22,840 (321)</td>
</tr>
<tr>
<td>India</td>
<td>6,140 (86)</td>
<td>-20.8</td>
<td>4,860 (68)</td>
</tr>
<tr>
<td>North America</td>
<td>7,130 (100)</td>
<td>+21.5</td>
<td>8,660 (122)</td>
</tr>
<tr>
<td>Europe</td>
<td>3,740 (53)</td>
<td>+36.6</td>
<td>5,110 (72)</td>
</tr>
<tr>
<td>Rest of the world</td>
<td>6,870 (96)</td>
<td>+12.7</td>
<td>7,740 (109)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>41,940 (589)</strong></td>
<td><strong>+17.3</strong></td>
<td><strong>49,210 (691)</strong></td>
</tr>
</tbody>
</table>

**Nine months**

<table>
<thead>
<tr>
<th>3rd qtr ended Dec 31st</th>
<th>2017 ($ million)¹</th>
<th>% change</th>
<th>2018 ($ million)²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latin America</td>
<td>39,270 (551)</td>
<td>+24.5</td>
<td>48,900 (686)</td>
</tr>
<tr>
<td>India</td>
<td>27,290 (383)</td>
<td>+3.0</td>
<td>28,110 (395)</td>
</tr>
<tr>
<td>North America</td>
<td>17,870 (251)</td>
<td>+12.3</td>
<td>20,070 (282)</td>
</tr>
<tr>
<td>Europe</td>
<td>13,220 (186)</td>
<td>+15.4</td>
<td>15,260 (214)</td>
</tr>
<tr>
<td>Rest of the world</td>
<td>19,220 (270)</td>
<td>+8.1</td>
<td>20,780 (292)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>116,870 (1,641)</strong></td>
<td><strong>+13.9</strong></td>
<td><strong>133,120 (1,869)</strong></td>
</tr>
</tbody>
</table>

¹ includes non-agrochemical sales; ² at the current rate.
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Nissan’s agchem sales down 6% in Q3

Nissan Chemical’s consolidated agrochemical sales (including some veterinary products) fell by 6% to ¥5,969 million ($54.4 million) in the three months to December 31st 2018. The company posted an operating loss for the business of ¥1,319 million ($12 million) in the third quarter of Nissan’s fiscal year ending March 31st 2019. That compared with a loss of ¥679 million ($6.2 million) in the third quarter of the prior fiscal year.

The company saw higher overseas sales of the insecticide, Gracia (fluxametamide), and the fungicides, Pulsor (thifluzamide) and Leimay (amisulbrom), and domestic gains for the herbicides, Roundup (glyphosate) and Altair (metazosulfuron). However, these gains were more than offset by lower sales of the herbicides, Targa (quizalofop-ethyl), Permit (halosulfuron-methyl) and Sirius (pyrazosulfuron-methyl), and the acaricide, Starmite (cyenopyrafen).

Sales in the first nine months of the year rose by 6.6% to ¥34,649 million. Overseas revenues were boosted by increased sales of Pulsor and Permit, and the launch of Gracia in South Korea. Sales of Roundup in Japan were down by 11% due to the impact of earlier shipments in the previous fiscal year, intense heat and natural disasters in Japan during the first half. Nine-month operating income rose by 14.3% to ¥8,527 million.

Nissan Chemical’s consolidated agrochemical sales (¥ million)

<table>
<thead>
<tr>
<th>Period</th>
<th>2017 ($ million)</th>
<th>% change</th>
<th>2018 ($ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>6,347 (57.9)</td>
<td>-6.0</td>
<td>5,969 (54.4)</td>
</tr>
<tr>
<td>Operating profit</td>
<td>[679] [(6.2)]</td>
<td>-</td>
<td>[1,319] [(12.0)]</td>
</tr>
</tbody>
</table>

Nine months

<table>
<thead>
<tr>
<th>Period</th>
<th>2017 ($ million)</th>
<th>% change</th>
<th>2018 ($ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>32,494 (316.0)</td>
<td>+6.6</td>
<td>34,649 (296.4)</td>
</tr>
<tr>
<td>Operating profit</td>
<td>7,459 (77.8)</td>
<td>+14.3</td>
<td>8,527 (68.0)</td>
</tr>
</tbody>
</table>

1 at the current rate.
CAC 2019 20th China International Agrochemical & Crop Protection Exhibition

FSHOW 2019 10th China International Fertilizer Show

CACE 2019 20th China International Agrochemical & Crop Protection Equipment Exhibition

2019 Year 5-7 Day

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Global crop protection market up 4% in 2018

Global chemical-based crop protection sales rose by 4.2% to $56,500 million at the ex-manufacturer level in 2018, according to figures from Phillips McDougall. These are preliminary estimates, the consultancy emphasises.

Sales of all pesticides, including non-crop products, were 4.1% higher at $64,038 million. Growth was slightly weaker for non-crop pesticide sales, which were up 3.1% at $7,538 million.

Recovery in the Brazilian market, the largest in the world, is the major driver of last year’s growth, the consultancy says. The “excessive” crop protection inventories which resulted in the 2017 decline have been addressed and are no longer such an issue, it explains.

Phillips McDougall also highlights generally high crop protection prices, resulting partly from supply shortages. In particular, it notes higher prices of products originating from China as a result of the environmental pressures and consolidation in the national industry. Prices were also driven higher by the tariffs imposed by the US on some Chinese chemical imports. It cites agrochemical companies Albaugh and FMC reporting that that they had increased their prices partly as a result of the higher tariffs.

Eight active ingredients debuted in 2018, the “highest level of new product introductions since 2012”. They include: three insecticides, Nippon Kayaku’s flometoquin, BASF/Meiji Seika Pharma’s afidopyropen (trade-marked as Inscalis), and DowDuPont’s triflumezopyrim (trade-marked as Pyraxalt); one acaricide/insecticide, Nissan Chemical’s fluxametamide; three herbicides, Kumiai Chemical’s fenquinotrione, DowDuPont’s florpyrauxifen-benzyl (trade-marked as Rinskar), and FarmHanong’s tiafenacil; as well as one fungicide, Nihon Nohyaku’s pyraziflumid.

Global agrochemical market ($ million)

<table>
<thead>
<tr>
<th>Market segment</th>
<th>2017¹</th>
<th>% change</th>
<th>2018²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop protection</td>
<td>54,219</td>
<td>4.2</td>
<td>56,500</td>
</tr>
<tr>
<td>Non-crop pesticides</td>
<td>7,311</td>
<td>3.1</td>
<td>7,538</td>
</tr>
<tr>
<td>Total agrochemicals</td>
<td>61,530</td>
<td>4.1</td>
<td>64,038</td>
</tr>
</tbody>
</table>

¹ includes 2016-17 southern hemisphere season; ² includes 2017-18 southern hemisphere season.
Source: Phillips McDougall.
Crop protection product sales by region ($ million)

<table>
<thead>
<tr>
<th>Region</th>
<th>2017(^1)</th>
<th>% change</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia Pacific</td>
<td>16,300</td>
<td>+4.6</td>
<td>17,050</td>
</tr>
<tr>
<td>Latin America(^2)</td>
<td>12,665</td>
<td>+6.0</td>
<td>13,425</td>
</tr>
<tr>
<td>Europe</td>
<td>12,374</td>
<td>+3.2</td>
<td>12,770</td>
</tr>
<tr>
<td>NAFTA</td>
<td>10,761</td>
<td>+3.2</td>
<td>11,105</td>
</tr>
<tr>
<td>Middle East/Africa</td>
<td>2,110</td>
<td>+1.9</td>
<td>2,150</td>
</tr>
<tr>
<td>Total (world)</td>
<td>54,223</td>
<td>+4.2</td>
<td>56,500</td>
</tr>
</tbody>
</table>

\(^1\) calculated from 2018 growth figure; \(^2\) excluding Mexico.
Source: Phillips McDougall.

**Outlook**

On balance, Phillips McDougall estimates a “relatively flat” market in 2019. It reports a strong start to the planting season in the southern hemisphere. This is partly in response to Chinese tariffs on US soybean imports in retaliation for those in the opposite direction. That benefited soybean exporters mainly in Argentina and, to some extent, in Brazil. This augurs well for crop protection sales early in the year, the consultancy estimates.

There are reports of the el Niño phenomenon – albeit “weak” compared with 2015/16 – that would boost the soybean harvest in Brazil. Any developing El Niño conditions have the potential to impact production in Asia Pacific with the region having historically experienced generally dry conditions with reduced monsoon rainfall under such circumstances.

Industry innovation looks like it could be similar to that in 2018 with six new ais ear-marked for debuts. They include: BASF’s sterol biosynthesis inhibitor isopropylazol fungicide, mefentrilfluazonazo (trade-marked as Revysol); Bayer’s Crop Science division’s diamide insecticide, tetraniliprole; Bayer legacy company Monsanto’s nematicide, tioxazafen; FMC’s broad-spectrum fungicide, F9650; and DowDuPont’s fungicide, fenpicoxamid.

The consultancy anticipates increased demand for “higher value” herbicides than glyphosate following the rising adoption of traits conferring tolerance to such herbicides. They include, “notably”, dicamba and 2,4-D.
UPL Interview: The complementarity of UPL and Arysta makes the combined business more resilient

UPL completed its acquisition of Platform Specialty Products’ agrochemical business, Arysta LifeScience, on February 1st. Agrow’s Sanjiv Rana met UPL’s Jai Shroff (global CEO), Carlos Pellicer (COO integration, global strategy and special growth initiatives) and Hildo Brilleman (region head for Europe). The meeting took place at UPL’s London office.

Sanjiv Rana (SR): What factors led you to make the Arysta acquisition? Did UPL feel pressured by the other big M&As within the industry?

Jai Shroff (JS): We have always had an organic growth business plan for UPL. We are a reasonably acquisitive company – so whenever someone is selling something, they do ask us. And whenever we see a good deal, we do examine it. We have acquired lots of businesses along the way and they have always been driven by a strategy to access certain markets. For instance, in Brazil, we had been looking to acquire a business since 1991, but the timing never seemed to be right because either the prices were too high or the market was not in a good shape. So, until 2010, we had a very limited business in the country. Similarly, with Arysta, we always liked the business and it made sense as it was very synergistic to us. But we were only successful this time as we were able to get it at the right value. So, we are not hung up on acquisitions for going into new markets. We have our own organic growth strategy. But having said that, size does matter. We have increased presence across the world and we can invest in R&D and production in diverse markets.

Carlos Pellicer (CP): One of the underlying success factors of UPL has been prudent financial management. One of the reasons UPL succeeded in Latin America was the capability to manage volatility and to mitigate risks.

Hildo Brilleman (HB): This is one of the things that the two companies (UPL and Arysta) have in common. Arysta has had a big presence in sub-Saharan Africa, and that required us to manage not only currency volatility but also the political environment. So, the two companies are fairly complementary in that aspect as well.

SR: How are the two companies complementary to each other?

JS: I would like to point out that while both are large players with presence in multiple geographies, we received regulatory approvals the world over without being asked for any kind of divestment. That just shows how complementary the businesses are – we have almost no overlap. Not only do we have complementary product portfolios, but also complementary market access. If you look at eastern Europe and the CIS countries, Arysta has enjoyed a strong presence whereas UPL has been very slender there. In Africa as well, Arysta has a good presence. It’s similar in crop segments. UPL is strong in soybeans and maize, while Arysta has had a specialty crops focus. We also have a complementary product mix. Apart from the obvious cost synergies, it just makes the combined companies more resilient.

HB: The fact that for a transaction of this size, we could get EU regulatory approval within six months, is quite unprecedented. It reflects the complementarity of the product range.

SR: The acquisition has made UPL the biggest generic company globally, overtaking Adama. What are the plans now? Any further acquisitions on the cards?

JS: We have always looked at complementary acquisitions, but it’s not part of our strategy – it’s an opportunity-based approach. We’ve always had an organic growth business plan. Of course, we will look at new opportunities, add technology platforms and markets. But our focus is always organic growth. The immediate focus is to make a seamless transition into the new UPL.

SR: Do you foresee any more big M&As in the market or is yours the last one for now?
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JS: Things can happen in segments of businesses but not overall. But you never know. Four years ago, no one could have predicted that Bayer would have bought Monsanto. It’s not easy now because the market shares have become significant. But for us at least the next 3-4 years, the focus will more likely be on integrating businesses and on organic growth.

SR: In the last couple of years, some countries in Latin America, especially Brazil, have been in trouble because of an inventory glut in the distribution channel. How did that impact UPL?

JS: We managed it quite well in the region because, in each country, especially Brazil, we created a segment that did not exist earlier. In Brazil, it was about managing soybean rust with a completely new concept. We try to look at farmers’ challenges to come up with specific solutions. We are not just a “me too” company. When you create a new segment, farmers will buy your product. Of course, Brazil has suffered because of overstocking of products in the last 2-3 years. When a market shrinks from $10 billion to some $8 billion, companies that are in an aggressive mode at the time do get caught. Especially when markets in other parts of the world are also slowing down, Brazil becomes one of the biggest markets. We cannot be starkly different from the other companies in the market, but just having a slightly different approach helps us continue our growth.

CP: One of the factors that helped us in inventory management was our manufacturing capability. Most companies today depend too much on a huge supply chain, long lead times, depending too much on others – so time to market becomes too long. They take positions and then cannot manage that. UPL has a huge manufacturing footprint and we can react to market needs quickly.

HB: And given the China situation, being backward integrated makes so much more sense. That’s a real competitive advantage. When everyone was cutting down on manufacturing and moving production to China, UPL went a different way. It moved to create more capacity.

SR: How was the market development in 2018? Has the new Brazilian government had a positive impact on the market?

JS: Brazil has done very well in 2018 for all companies. Everyone has done well. That’s primarily because Brazil has become a bigger exporter this year for soybeans and maize. The agrochemical market has also grown strongly by 15-20%. It’s too early to say anything about the impact of the new government – that’s something to be discussed, let’s say, three years from now.

CP: Brazil has been lucky to have had a good agriculture policy. The new government is likely to focus on infrastructure issues that have been hindering agricultural growth and we see this as a positive.

SR: Has the US/China tariff war had any impact on Indian companies trying to act as manufacturing hub for companies based in the US? Has some of the production moved from China to India?

JS: No. To move production, to even get a manufacturing licence, you need 1.5-2 years. By the time you put a production facility in place and stabilise it, it takes 3-4 years. So, it’s not realistic that manufacturing could move from China to India. What you already have, you might sell a little bit more, but nothing more than that.

SR: Arysta has had a strong presence in biostimulants. What are your views on market developments in bio stimulants and biologicals in general?

HB: Arysta has historically had a strong position in biostimulants. In biostimulants, you really need to prove yourself from a scientific basis, and there were a lot of products in the market where there were difficulties to consistently deliver on claims. Biostimulants are maturing as an industry, which makes it easier to get farmers and distributors on board. We are well positioned to capture that growth, more than our competitors.

In biocontrol, we are at a flex point – technologies are getting better and we see more consistency. The threshold of what level of control is accepted by farmers is also coming down. Farmers realise that you cannot just say that: I have my 95% efficacy products and I expect exactly the same from biocontrol products. It’s not easy to get the same efficacy in biocontrol as a chemical equivalent. You put biocontrol into a balanced programme, you can match – the same overall control, the same or even better yield and marketable quality. We are going through that flex point now where we are seeing more acceptance of biocontrol on the ground.

SR: What are some of the specific initiatives you plan to launch under your project called Open Ag?

JS: UPL has, in the last 3-4 years, realised that it needs to partner with other companies. Open Ag stands for open-minded and win-win partnerships with any player in the agricultural space to create a network that brings sustainable growth for all involved. So, we have begun to take initiatives in that. If you look at Arysta, it has had a successful record in Open Ag, with its Japanese heritage. What they have done, with manufacturing companies, with technology licencing, with bio solution companies are fantastic and we want to embrace this in the new UPL. The challenges in agriculture, such as sustainability cannot be solved by one single company. We have access to farmers and a big market, but if there’s a unique solution, we can take it to market faster. We don’t want to necessarily say that we want to sell only what we invented. We want to have an approach where we work with people and bring the best technology available to really make a difference. This is the approach that will be the winning formula for everyone. This is the way of developing sustainable solutions that become a way of life.

HB: A lot of people see value chains as linear. We see them as a network.

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See https://enigmamarketingresearch.com/pages/supplementary-protection-certificates
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<tr>
<th>Herbicide</th>
<th>Insecticide</th>
<th>Fungicide</th>
</tr>
</thead>
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<tr>
<td>Nicosulfuron 97% TC</td>
<td>Imidacloprid 95%TC, 97% TC</td>
<td>Kresoxim-methyl 96%TC</td>
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<tr>
<td>MCPA 95% TC</td>
<td>Fipronil 95% TC, 97% TC</td>
<td>Carbendazim 93% TC</td>
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<td>Cartap 98% TC</td>
<td>Thiophanate-methyl 97%TC</td>
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<td>Glyphosate 96%TC</td>
<td>Lambda-cyhalothrin 97% TC</td>
<td>Flusilazole 95% TC</td>
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<tr>
<td>Fenoxaprop-P-ethyl 97% TC</td>
<td>Chlorpyrifos 97% TC</td>
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<td>Pirimicarb 95% TC</td>
<td>62%SL, 540g/l SL, 75.7%GR,</td>
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<td>Quinalofop-P-ethyl 97%TC</td>
<td>Dichlorvos 94% TC</td>
<td>77.7%GR, 88.8%GR</td>
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---

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An analysis of supplementary protection certificates

Supplementary Protection Certificates (SPCs) for plant protection products (PPPs) entered into law in the EU in 1997 following the entry into force of EU Regulation 1610/96. That was a result of lobbying by the R&D-based crop protection companies arguing that PPPs should be treated in a similar manner to pharmaceuticals, which already had SPCs in force in 1993 following EU Regulation 1768/92.

The EU recognised that differences between plant protection, pharmaceutical and animal health products existed and hence a separate Regulation for PPPs was required. The fundamentals for all three sectors are, however, similar in that SPCs are an intellectual property right that aims to offset the loss of patent protection which occurs due to the mandatory testing required to obtain regulatory marketing approval.

SPC protection is available in all EU member states and is also available in the following non-EU States which may nonetheless be covered by a European patent application granted by the EPO:

- Norway and Iceland (EEA member states, apply EU regulation)
- Switzerland (national law based on the EU regulation)
- Liechtenstein (SPC issued in Switzerland automatically takes effect)

SPCs for PPPs:
- apply to a specific product within a patent which is on the market,
- come into effect upon patent expiry
- last for up to a maximum of five years from date of patent expiry
- are granted in Europe on a national basis.

The actual term of the extension depends on a number of issues, key being the first marketing date of the product in an EU country and an SPC will expire at whichever is the earlier of:
- 15 years from the first Marketing Authorisation in the EU/EEA
- 5 years from the expiry of the basic patent

(*Switzerland is not an EU/EEA member, therefore the first Marketing Authorisation in Switzerland is a national authorisation granted by the local authorities.)

By October 2018, over 2,203 PPP SPCs records were in existence. Of these, 1,732 (78.6%) are granted SPCs, 262 are applications and the balance have either been rejected or withdrawn.

Analysing granted SPCs by applicant shows a discrepancy compared to turnovers.

<table>
<thead>
<tr>
<th>Company</th>
<th>Number of granted SPCs</th>
<th>Turnover 2017 ($m)</th>
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<tbody>
<tr>
<td>Bayer CropScience</td>
<td>508</td>
<td>9,103</td>
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<tr>
<td>Syngenta</td>
<td>391</td>
<td>9,731</td>
</tr>
<tr>
<td>BASF</td>
<td>310</td>
<td>5,569</td>
</tr>
<tr>
<td>Corteva (DowDuPont)</td>
<td>226</td>
<td>6,161</td>
</tr>
</tbody>
</table>

1 includes acquired and/or merged companies
The importance of mixture products and associated patents and SPCs for PPPs

The decline in the discovery of new active ingredients has been compensated by an increased development of mixture (combination) products over the last 20 years. In addition to the technical advantages (improved application, synergism, the fight against resistance etc) that mixture products provide, there are obvious commercial advantages such as market segmentation/differentiation, brand awareness and additional IPR. 43% of all granted SPCs are to mixture products.

Prothioconazole is an important fungicide for the European market and the following mixture products that have SPCs demonstrate their importance. Not only does this portfolio present a very complex market situation but it also segments the market, making it very difficult for the generic sector to take significant market share.

Certain mixture products have been granted patents based on synergistic effect resulting in relatively old aIs gaining a new lease of protected (IPR) life.

BASF’s metazachlor is a relatively old ai with the basic patent having expired and no SPCs being granted to the single ai. However, a number of mixture products have been granted patents and SCPs are in force in a number of countries.

**Identifying gaps in SPC portfolios**

One of the key steps in obtaining an SPC in a particular country is the need to apply for the SPC within six months of the date of first marketable use of a new combination product. As the table below demonstrates, very few Japanese companies seem to have realised the potential additional protection that SPCs can achieve as the following table demonstrates:

<table>
<thead>
<tr>
<th>Company</th>
<th>Number of granted SPCs</th>
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</thead>
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<tr>
<td>ISK</td>
<td>70</td>
</tr>
<tr>
<td>Sumitomo</td>
<td>32</td>
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<tr>
<td>Nippon Soda</td>
<td>29</td>
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<tr>
<td>Nihon Nohyaku</td>
<td>18</td>
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<tr>
<td>Nissan</td>
<td>7</td>
</tr>
</tbody>
</table>

**Prothioconazole mixtures with SPCs**

- benzovindiflupyr + prothioconazole
- bixafen + fluoxastrobin + prothioconazole
- bixafen + prothioconazole
- bixafen + prothioconazole + spiroxamine
- bixafen + prothioconazole + tebuconazole
- fluioxastrobin + prothioconazole + tebuconazole
- fluopyram + fluoxastrobin + prothioconazole + tebuconazole
- fluopyram + prothioconazole
- fluopyram + prothioconazole + tebuconazole
- fluoxastrobin + prothioconazole
- imidacloprid + prothioconazole
- isopyrazam + prothioconazole
- penflufen + prothioconazole
- prothioconazole + spiroxamine
- prothioconazole + tebuconazole
- prothioconazole + triadimenol + triazoxide
the first marketing date in that country. Thus, if patent departments are not vigilant and thorough, mistakes might be made resulting in countries not getting SPC protection. Analysing SPCs can identify gaps in SPC portfolios and therefore markets that might be entered prior to SPC expiry in the major markets.

For instance, bixafen is protected by EP1490342 (and other equivalent national patents), which is due to expire on 06/02/2023. Granted SPCs, extending protection to 2025, exist in the following countries: Austria, Belgium, Bulgaria, Switzerland, Germany, Estonia, Spain, France, Hungary, Ireland, Italy, Romania, Sweden (SPC application only at this stage), Slovakia and the UK.

Are there other markets beyond these where bixafen is used and can generic companies exploit these? Other issues such as data protection will also help protect the market from generic competition and the process for a generic company to determine whether a market is legally accessible and economically worth developing is complex.

In the EU, 1,393 SPC applications have been rejected for one reason or another. Analysis of these rejections may identify gaps in the market for other companies to exploit. For example, the market for single active prothioconazole is protected by SPCs in 17 countries, demonstrating the importance of the product. However, the application for Poland was rejected. An eagle-eyed company might have been able to consider entering the Polish market, and other countries, when the original patent expired in 2015 instead of waiting until 2019 when SPCs expire.

<table>
<thead>
<tr>
<th>Mixture product</th>
<th>Patent Number</th>
<th>Date of patent Application</th>
<th>Typical expiry of SPCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>clomazone + dimethenamid-P + metazachlor</td>
<td>EP1656021</td>
<td>15/07/2004</td>
<td>2029</td>
</tr>
<tr>
<td>dimethenamid-P + metazachlor</td>
<td>EP1810570</td>
<td>15/02/1994</td>
<td>2019</td>
</tr>
<tr>
<td>imazamox + metazachlor</td>
<td>EP1734823</td>
<td>30/03/2005</td>
<td>2025</td>
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<tr>
<td>imazamox + metazachlor + quinmerac</td>
<td>EP1980149</td>
<td>30/03/2005</td>
<td>2027</td>
</tr>
</tbody>
</table>

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- ABAMECTIN
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- ETOXAZOLE
- FIPRONIL

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- ATRAZINE
- BISPYRIBAC-SODIUM
- BROMACIL
- CHLORIMORUM-ETHYL
- CLODINAFO-PROPARGYL
- DICAMBA

FUNGICIDE
- BENTHIAVALICARB
- BOSCALID
- Cyprodinil

REGULATOR
- ETHEPHON

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- LAMDBA-CYHALOTHIN
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- METHOMYL
- PYRIDALYL
- PYRIFLIXFEN
- SPIROTETRAMAT
- TEFLUBENURON
- THIAMETHOXAM
- DICLOSULAM
- FLORASULAM
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- FOMESAFEN
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The future?
Delays in authorisation of PPPs are unlikely to get shorter as registration requirements increase resulting in longer waits for the first marketing authorisation. Thus, SPCs will become even more important as the R&D sector seeks to defend market share and recoup R&D investment. The relative small size of the PPP market compared with pharmaceuticals means that R&D-based crop protection companies need to maximise IPR and consequently, the increase in mixture products and SPCs is likely to continue.

For the generic sector, any company planning to enter the PPP market in Europe must not only establish when the patent for the ai, mixture products or other secondary patents expire, but also whether SPCs have been granted and, if so, when they expire.

With 31 national offices, the European patent system is complex and makes the retrieval of SPC information a time consuming, uncertain and costly exercise.

In addition, analysing SPCs is an extremely useful tool for competitor intelligence as it clearly shows the markets in Europe that companies are targeting for increased protection and where gaps in IPR portfolios might exist.

It is important to understand that patent information is only a snapshot in time and it is essential to continuously track SPCs.

(The data used in this article are taken from Enigma Marketing Research’s database, AgSPC.db. For further information on AgSPC.db contact: Dr Nigel Uttley, nigel.uttley@enigmamarketingresearch.com.)
<table>
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<th>Company Name</th>
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<tr>
<td>Agro Dragon Group</td>
<td>9F Shuangge Mansion, No.438, Pudian Road, Pudong New Area, Shanghai 200122, China</td>
<td>+86 215 1172566</td>
<td><a href="http://www.agrodragon.com">www.agrodragon.com</a></td>
</tr>
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<td>+86 551 65360940</td>
<td><a href="http://www.fengle-agrochem.com">www.fengle-agrochem.com</a></td>
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<tr>
<td>Anhui Guangxin Agrochemical Co., Ltd</td>
<td>Caijiashan Pengcun Village, Xinhang Town, Guangde, Anhui, 242235, China</td>
<td>+86 215 0817211</td>
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<tr>
<td>Anhui Huaxing Chemical Co., Ltd</td>
<td>No. 6 Hongfeng Road, Hefei City, Anhui Province, 230088, P.R. China</td>
<td>+86 551 65848156</td>
<td><a href="http://www.huaxingchem.com">www.huaxingchem.com</a></td>
</tr>
<tr>
<td>CAC Group Co., Ltd</td>
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<td>+86 216 2398696</td>
<td><a href="http://www.cacch.com">www.cacch.com</a></td>
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<tr>
<td>Eastchem Co., Ltd.</td>
<td>Floor 26, Haoyuan Mansion, No.266, Middle Tangjiang Road, Changzhou, Jiangsu, China</td>
<td>+86 519 68786699</td>
<td><a href="http://www.eastchem.net">www.eastchem.net</a></td>
</tr>
<tr>
<td>Fuhua Tongda Agro-Chemical Technology Co., Ltd.</td>
<td>Qiaogou Town, WuTongqiao District, 614800 China</td>
<td>+86 216 8865055</td>
<td><a href="http://www.fuhua-tongda.com">www.fuhua-tongda.com</a></td>
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<td>Golden Harvest Chemical Co., Ltd.</td>
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<td>+86 216 5520181</td>
<td><a href="http://www.goldenharvest-chem.com">www.goldenharvest-chem.com</a></td>
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<tr>
<td>Guangxi Tianyuan Biochemistry Co., Ltd.</td>
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<td>+86 571 89287689</td>
<td><a href="http://www.udragon.cn">www.udragon.cn</a></td>
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<tr>
<td>Hebei Veyong Bio-Chemical Co., Ltd.</td>
<td>China</td>
<td>+86 311 85915963</td>
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<td><a href="http://www.jschanglong.com">www.jschanglong.com</a></td>
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<tr>
<td>Jiangsu Changqing Agrochemical Co., Ltd.</td>
<td>1 Jiangling Road, Putou Town, Jiangdu District, Yangzhou City, Jiangsu, 225218, China</td>
<td>+86 514 86421237</td>
<td><a href="http://www.jscq.com">www.jscq.com</a></td>
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<tr>
<td>Jiangsu Fengshan Group Co., Ltd.</td>
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<td>+86 258 6558671</td>
<td><a href="http://www.fschem.com">www.fschem.com</a></td>
</tr>
<tr>
<td>Jiangsu Flag Chemical Co., Ltd.</td>
<td>Changfenghe Road, Nanjing Chemical Industry Park, Luhe District, Nanjing, 210047, P.R.China</td>
<td>+86 255 8375015</td>
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<tr>
<td>Jiangsu Good Harvest-Weien Agrochemical Co., Ltd.</td>
<td>No. 1008, Yanhuai Road, Jianhu County, Jiangsu, 224700, China</td>
<td>+86 513 83885555</td>
<td><a href="http://www.good-harvest.cn">www.good-harvest.cn</a></td>
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<td>Jiangsu Huifeng Agrochemical Co., Ltd.</td>
<td>No. 92 People’s Road, Dafeng City in Jiangsu Province, 224100, China</td>
<td>+86 515 83252118</td>
<td><a href="http://www.hfagro.com">www.hfagro.com</a></td>
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<tr>
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<td>+86 519 82824504</td>
<td><a href="http://www.jsmone.com">www.jsmone.com</a></td>
</tr>
<tr>
<td>Jiangsu Kesheng Group Co., Ltd.</td>
<td>No. 888, Yanhuai Road, Jianhu County, Jiangsu, 224700, China</td>
<td>+86 515 86267666</td>
<td><a href="http://www.kesheng.com">www.kesheng.com</a></td>
</tr>
<tr>
<td>Jiangsu Lanfeng Biochemical Co., Ltd</td>
<td>No. 120, Xinyi Xin'anlu, Jiangsu Province, 221400, China</td>
<td>+86 516 88923437</td>
<td><a href="http://www.jslanfeng.com">www.jslanfeng.com</a></td>
</tr>
<tr>
<td>Jiangsu Sevencontinent Green Chemical Co., Ltd.</td>
<td>Dongsha Chemical Zone, Zhangjiagang, Jiangsu Province, China</td>
<td>+86 512 58609901</td>
<td><a href="http://www.sevencontinent.com">www.sevencontinent.com</a></td>
</tr>
<tr>
<td>Jiangsu Sword Agrochemicals Co., Ltd.</td>
<td>No. 1008, Guanhu Road (East), Jianhu, Jiangsu, 224700, China</td>
<td>+86 515 86252132</td>
<td><a href="http://www.swordchem.com">www.swordchem.com</a></td>
</tr>
<tr>
<td>Jiangsu Tianrong Group Co., Ltd.</td>
<td>147 Pingling East Rd, Liyang City, Jiangsu Province, China</td>
<td>+86 519 7299384</td>
<td><a href="http://www.jstrgf.com">www.jstrgf.com</a></td>
</tr>
<tr>
<td>Jiangsu Yangnong Chemical Co., Ltd.</td>
<td>39 Wenfeng Road, Yangzhou Jiangsu, China</td>
<td>+86 514 85889958</td>
<td><a href="http://www.yangnong.net">www.yangnong.net</a></td>
</tr>
<tr>
<td>Jiangsu Yongan Chemical Co., Ltd.</td>
<td>Xuehang Chemical Industrial Park, Lianshui County, Jiangsu Province, 223400, China</td>
<td>+86 574 87065196</td>
<td><a href="http://www.yachemical.com">www.yachemical.com</a></td>
</tr>
<tr>
<td>Jiangyin Milagro Chemical Co., Ltd.</td>
<td>RM 1205, Kaisa Plaza, 1091 East Renmin Road, Jiangyin, Jiangsu, China</td>
<td>+86 510 80618091</td>
<td><a href="http://www.milagrochem.com">www.milagrochem.com</a></td>
</tr>
<tr>
<td>Jiangyin Suli Chemical Co., Ltd.</td>
<td>7-1, Runhua Road, Lingang Street, Jiangyin City, Jiangsu, 214444, China</td>
<td>+86 510 86631388</td>
<td><a href="http://www.suli.com">www.suli.com</a></td>
</tr>
<tr>
<td>Jingbo Agrochemicals Technology Co., Ltd.</td>
<td>Economic Development Zone, Boxing County, Shandong Province, China</td>
<td>+86 543 2510800</td>
<td><a href="http://www.jbnh.cn">www.jbnh.cn</a></td>
</tr>
<tr>
<td>JRB Packaging Co., Ltd.</td>
<td>No. 268, Huangpu River Road, Kunshan City, Jiangsu Province Economic and Technological Development Zone, 215300, China</td>
<td>+86 512 57718695</td>
<td><a href="http://www.jrbpack.com">www.jrbpack.com</a></td>
</tr>
<tr>
<td>King Quenson Industry Group Ltd.</td>
<td>Room 1402, Block A, Future Plaza, Qiaocheng Bei Road, Nanshan District, Nanshen City, Guangdong, China</td>
<td>+86 755 86612760</td>
<td><a href="http://www.kingquenson.com">www.kingquenson.com</a></td>
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<table>
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<th>Company Name</th>
<th>Address</th>
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<tbody>
<tr>
<td>Kingtai Chemicals Co., Ltd</td>
<td>9F, Huarong Times Mansion Hi-tech Development Zone, Binjiang, Hangzhou, China</td>
<td>+86 571 87110716</td>
<td><a href="http://www.kingtaichem.com">www.kingtaichem.com</a></td>
</tr>
<tr>
<td>Lianhetech</td>
<td>8 Yongjiao Road, Huangyan Economic Development Zone, Taizhou City, Zhejiang Province, 318020, China</td>
<td>+86 576 8427 5170</td>
<td><a href="http://www.lianhetech.com">www.lianhetech.com</a></td>
</tr>
<tr>
<td>Lier Chemical Co., Ltd.</td>
<td>Economic and Technical Development Zone, Mianyang, Sichuan, 621000, P.R. China</td>
<td>+86 816 2547206</td>
<td><a href="http://www.lierchem.com">www.lierchem.com</a></td>
</tr>
<tr>
<td>Limin Chemical Co., Ltd.</td>
<td>Economic Development Zone, Xinyi Jiangsu Province, China</td>
<td>+86 516 88923527</td>
<td><a href="http://www.chinalimin.com">www.chinalimin.com</a></td>
</tr>
<tr>
<td>Maxunitech Inc.</td>
<td>No. 603, Binkang Road, Hangzhou, Zhejiang Province 310052, P.R. China</td>
<td>+86 571 28007880</td>
<td><a href="http://www.maxunitech.com">www.maxunitech.com</a></td>
</tr>
<tr>
<td>Nanjing Essence Fine-Chemical Co., Ltd.</td>
<td>9th Floor, No. 58 Nanhu Road, Nanjing, 210017, China</td>
<td>+86 258 6518999</td>
<td><a href="http://www.essencechem.com">www.essencechem.com</a></td>
</tr>
<tr>
<td>Nanjing Red Sun Co., Ltd.</td>
<td>No. 589 Zhushan Road, Jiangning District, Nanjing 211112, China</td>
<td>+86 258 7151768</td>
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<tr>
<td>Nantong Jiangshan Agrochemical &amp; Chemicals Co., Ltd.</td>
<td>No. 35 Yaogang Road Nantong Jiangsu Province, 226006, China</td>
<td>+86 513 83513131</td>
<td><a href="http://www.jsac.com">www.jsac.com</a></td>
</tr>
<tr>
<td>Noposion Agrochemicals Co., Ltd</td>
<td>113 Iron Kang Reservoir Road, Shenzhen Bao'an District, 518102, China</td>
<td>+86 755 29977288</td>
<td><a href="http://www.noposion.com">www.noposion.com</a></td>
</tr>
<tr>
<td>Nutrichem Company Limited</td>
<td>Building D-1, Dongshen Science Park, No. 66 Xixiaokou Road, Haidian District, Beijing 100192, P.R. China</td>
<td>+86 108 2819999</td>
<td><a href="http://www.nutrichem.cn">www.nutrichem.cn</a></td>
</tr>
<tr>
<td>Psyche Chem Group</td>
<td>Room 906, 555 Nanjing Road (West), Shanghai, 200040, China</td>
<td>+86 216 136 7911</td>
<td><a href="http://www.psychem.com">www.psychem.com</a></td>
</tr>
<tr>
<td>Qingdao Hansen Biologic Science Co., Ltd</td>
<td>5th Floor, District A, No.3 Building, Shilaoren Technical Innovation Park, No.143, Zhuzhou Road, Laoshan District, Qingdao, 266101, China</td>
<td>+86 532 85766777</td>
<td><a href="http://www.qdhansen.com">www.qdhansen.com</a></td>
</tr>
<tr>
<td>Shandong Binnong Technology Co., Ltd.</td>
<td>No. 518, Yongxin Road, Binbei Town, Binzhou City, Shandong Province, China</td>
<td>+86 543 3368839</td>
<td><a href="http://www.binnong.com">www.binnong.com</a></td>
</tr>
<tr>
<td>Shandong Cynda Chemical Co., Ltd.</td>
<td>Floor 6, Building D, In-hi tech Square, No. 2008 Xinluo Street, Jinan, Shandong, China</td>
<td>+86 531 88873317</td>
<td><a href="http://www.cynda.cn">www.cynda.cn</a></td>
</tr>
<tr>
<td>Shandong Huayang Science And Technology Co., Ltd.</td>
<td>China</td>
<td>+86 800 8607399</td>
<td><a href="http://www.huayang.com">www.huayang.com</a></td>
</tr>
<tr>
<td>Shandong Kangqiao Bio-Technology CO., LTD</td>
<td>A-903, Vanke Center, No. 2 South Heilongjiang Road, Qingdao City, Shandong Province, 266000, China</td>
<td>+86 532 85624007</td>
<td><a href="http://www.kqbiotech.com">www.kqbiotech.com</a></td>
</tr>
<tr>
<td>Shandong Luba Chemical Co., Ltd.</td>
<td>18th Floor, Building A, Fengrun Business Plaza, No.100 South Gongye Road, Jinan, China</td>
<td>+86 531 81795399</td>
<td><a href="http://www.lubachem.com">www.lubachem.com</a></td>
</tr>
<tr>
<td>Shandong Qiaochang Chemical Co., Ltd.</td>
<td>China</td>
<td>+86 543 2226170</td>
<td><a href="http://www.qiaochang.com">www.qiaochang.com</a></td>
</tr>
<tr>
<td>Shandong Vicorne Greenland Chemical Co., Ltd.</td>
<td>Jinan City, Shandong Province Zhangqiu Mateo Town Industrial Park, 250204, China</td>
<td>+86 400 618 6178</td>
<td><a href="http://www.greenlandchem.com">www.greenlandchem.com</a></td>
</tr>
<tr>
<td>Shandong Weifang Rainbow Chemical Co., Ltd.</td>
<td>19th &amp; 20th Floor, Fuhua Financial Centre, Building A3-4, No. 7000 East Jingshi Road, Jinan, China 250101</td>
<td>+86 531 88875225</td>
<td><a href="http://www.rainbowchem.com">www.rainbowchem.com</a></td>
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<tr>
<td>Shenzhen Baocheng Chemical Industry CO., LTD</td>
<td>A1603 Tian An Plaza, Remin Nan Road, Shenzhen, P.R.China</td>
<td>+86 755 82192178</td>
<td><a href="http://www.baochengagro.com">www.baochengagro.com</a></td>
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<tr>
<td>Shenzhen Kingtech</td>
<td>Room 1410, Tower 4, Excellence Century Center, Fuhua 3rd Road, Futian District, Shenzhen, P.R. China</td>
<td>+86 755 25195648</td>
<td><a href="http://www.kingtech.com">www.kingtech.com</a></td>
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<tr>
<td>Sinochem Agro Co., Ltd.</td>
<td>17-19th, No. 33 He Nan Road(S), Shanghai, 200002, China</td>
<td>+86 216 1381888</td>
<td><a href="http://www.sinochemagro.com">www.sinochemagro.com</a></td>
</tr>
<tr>
<td>Suzhou Eagro Limited</td>
<td>Suite 902, Metropolitan Towers A, 199 Shishan Road, Suzhou 215011, China</td>
<td>+86 512 6818 8055</td>
<td><a href="http://www.eagro.net">www.eagro.net</a></td>
</tr>
<tr>
<td>Tide group</td>
<td>7th Floor Anni Domini Building Tower South 8 Qiushi Road Hangzhou 310013, China</td>
<td>+86 571 85270003</td>
<td><a href="http://www.tide-china.com">www.tide-china.com</a></td>
</tr>
<tr>
<td>Trustchem</td>
<td>D/23rd Floor Golden Eagle International Plaza, 89 Hanzhong Rd., Nanjing, 210029, China</td>
<td>+86 258 4729803</td>
<td><a href="http://www.trustchem.com">www.trustchem.com</a></td>
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<tr>
<td>Wynca - Zhejiang Xinan Chemical Industry Group Co., Ltd.</td>
<td>Xianjiang, Jiande, Zhejiang, P.R China P.C 311600</td>
<td>+86 571 87220464</td>
<td><a href="http://www.wynca.com">www.wynca.com</a></td>
</tr>
<tr>
<td>Yifan Biotechnology Group Co., Ltd.</td>
<td>Room NO.1405 Development Mansion New City Avenue, Wenzhou City, Zhejiang Province, China</td>
<td>+86 577 86636638</td>
<td><a href="http://www.chinayifan.com">www.chinayifan.com</a></td>
</tr>
<tr>
<td>Yongnong Biosciences Co., Ltd.</td>
<td>No.3 Weiqi Rd (East), Hangzhou Gulf Fine Chemical Zone ShangYu, Zhejiang, China</td>
<td>+86 575 82728868</td>
<td><a href="http://www.yongnongbiosciences.com">www.yongnongbiosciences.com</a></td>
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<tr>
<td>Zhejiang Biok Chemical Co., Ltd.</td>
<td>Rm.1558, Beijing New Century Office Building, No.6 Southern Road, Capital Gym, Beijing, P.R. China</td>
<td>+86 106 8492166</td>
<td><a href="http://www.biokchemical.com">www.biokchemical.com</a></td>
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<tr>
<td>Zhejiang Heben Pesticide &amp; Chemicals Co., Ltd.</td>
<td>Yanjiang Industrial Area, Lucheng District, Wenzhou City, Zhejiang Province, China</td>
<td>+86 577 55882935</td>
<td><a href="http://www.hb-p.com">www.hb-p.com</a></td>
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<tr>
<td>Zhejiang Jinfanda Biochemical Co., Ltd.</td>
<td>22 Floor, Tower B, New Youth Plaza, No. 205 Yingchun Rd.S, Tonglu, Zhejiang, China</td>
<td>+86 571 89803290</td>
<td><a href="http://www.jinfanda.com">www.jinfanda.com</a></td>
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<tr>
<td>Zhejiang Zhongshan Chemical Group Stock Co., Ltd.</td>
<td>2303# Taihu Avenue, Chanxing County Economic Development Park, Zhejiang, China 313100</td>
<td>+86 572 6121387</td>
<td><a href="http://www.zschem.com">www.zschem.com</a></td>
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- Glufosinate 95% Tech
- Digloba
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- Atrazine
- Bisculatap
- Chlorpyrifos
- Clethodim
- Cyhalofop-Butyl
- Cyproconazole
- Difenoconazole
- Fluroxypyr
- Imidacloprid
- Mesotrione
- Metribuzin
- Monosulfatap
- Propiconazole
- S-Metolachlor
- Tebuconazole
- Thiamethoxam
- Tricyclazole

Chemicals
- Caustic Soda flakes / Pearls
- Sodium Tripolyphosphate (STPP)
- Glycine (Industrial Grade)
- Paraformaldehyde
- Melamine 99.8%
- Methionine
- Hexamine
- Soda Ash
- Ammonium Chloride
- Triple Superphosphate
- DAP
- NPK
- MAP
- Urea

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Mesotrione  Imazapic  2,4-DP-p  MCPP-p  Fomesafen
Pinoxaden  Imazapyr  Dicamba  Clopyralid  Oxyfluorfen
Penoxsulam  Sulfentrazone  Glyphosate  Picloram  Atrazine
Diclosulam  Carfentrazone  Glufosinate  Diuron  Ametryn
Cloransulam  Amicarbazone  Bentazone  Triclopyr  Bispyribac
Flumetsulam  Flucarbazone  Clomazone  Bromacil  Propanil
Florasulam  Diflufenican  Fluroxypyr  Hexazinone  Benazolin

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Clothianidin  Indoxacarb  Profenofos  Acetamiprid  Pyriproxifen  Emanectin
Dinotefuran  Pyometrine  Fonicamid  Ethiprole  Methomyl  Spirodiclofen
Chlorfenapyr  Bifenthrin  Chlorpyrifos  Fipronil  Oxamyl  Lambda-cyhalothrin

fungicides

Azoxystrobin  Propiconazole  Tebuconazole  Benomyl  Captan
Pyraclostrobin  Cyproconazole  Bosalid  Carbendazim  Chlorothalonil
Trifloxystrobin  Difenconazole  Fludioxonil  Prochloraz  Mancozeb
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