China Import Ups 17.6% in H1(P3)

High Efficient Utilization of Organic Phosphorus Wastewater (P6)

ACE Conference Special(P18-28)
Founded in April, 1982, China Crop Protection Industry Association (CCPIA) was one of the earliest trade associations in China's chemical field. It is a non-profit national institution covering different regions, organizations/departments and industries, and possesses independent legal person status.

In the course of the more than two decades period since its establishment, CCPIA has undergone rapid development, witnessing its members increased from the originally 45 to 495 at present, covering producers/enterprises, R & D and design institutions, universities and colleges, provincial/municipal pesticide associations related with technicals and formulations, intermediates, auxiliaries, packing materials, packing equipments and applying machines, etc. CCPIA members' production value accounts for 90% of the national total pesticide production.
The 2013 International Forum on the Procurement & Services of Crop Protection Products and Conference on Crop Protection Science & Technology, in parallel with Agrochemex 2013, organized by China Crop Protection Industry Association, will be held at Shanghai Everbright International Hotel on October 20, 2013.

The events will cover marketing, new legislation and new data requirements, as well as innovation and technology improving. Since it began six years ago, the events has attracted thousands people, especially for technical and regulatory staffs and marketing specialists.

Original papers, surveys and presentations on all aspects of crop protection are invited. Possible topics for submission to the various sessions include, but are not limited by:

<table>
<thead>
<tr>
<th>Markets</th>
<th>status of local agrochemical industry or agriculture, strategies of international marketing, cooperation with Chinese companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policies</td>
<td>registration overseas, view of local pesticides regulation</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>synthesis of technicals, intermediates and pro-pesticides</td>
</tr>
<tr>
<td>Environmental science</td>
<td>new pollution treatment technology, green process, energy reduction and comprehensive use of resources</td>
</tr>
<tr>
<td>Process and application</td>
<td>formulation process, adjuvant and formula, application and efficiency</td>
</tr>
<tr>
<td>Marketing strategy</td>
<td>market exploration, import/export</td>
</tr>
<tr>
<td>Bio-pesticides</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>Agrochemical Residue &amp; Metabolism Chemistry</td>
</tr>
</tbody>
</table>

All papers should make clear titles, abstract, author(s), the affiliation (institution, agency or company) and location (city and state or country). Deadline is July 30th, 2013. Excellent papers will be elected and be presented in the forum, the authors will be awarded.

All the papers should be sent to ccpia.acc@gmail.com or yousheng@ccpia.org.cn before July 30th.

http://www.agrochemex.org
New Features of Temporary Pesticide Registration in 2012

According to ICAMA, the assessment for temporary registration of pesticide is constantly innovated. The evaluation system is enhanced with better quality to make sure that the registered products are more secure and reliable. There are 657 products for review, among which, 547 products passed while 110 products failed with 83% passing rate.

According to Pesticide Temporary Registration Review Committee, the following four features are noticeable:

I. The number of new pesticide applications achieves a new high point in recent years. The new pesticides for review are 53 species in the whole year, involving 37 products, which are the most in the recent decade. Half of the new species are registered and entrusted by overseas enterprises.

II. The type of environmental-friendly formulations increases fast with better quality. The environmental-friendly formulations have an increasing percentage among water-based and granules (GR) formulations. The number of water-based and granular products has increased; in a most rapidly pace among these years, to over 60% in 2011. Currently, the number of environmental-friendly products with valid registration has reached more than 3700.

III. The products show the characteristic of low toxicity. Among registered 47 Tech, only two has the medium toxicity, the rest are low toxicity, and no high toxicity. The registered products with low toxicity occupy more than 80%. The number of biological pesticide applications, such as botanical, microbial pesticides, and biochemical pesticides, are remarkable increased. 4 in 23 applied new pesticides are biopesticides.

IV. There is more focus on pesticide products security in the process of review. Excessive pesticide residues, the hazards of occupational and healthy problems for end-users, the products which are non-environmental-friendly and shall cause injuries or accidents, should be resolutely rejected. For example, pyroxystrobin in banana residues exceeding and cyproconazole, bromacil degraded slowly in the environment, were not approved. As for 2,4-D Butylate required to take various measures to avoid injury to occur: limited to the Northeast spring maize, the enterprise should be undertaken to carry out safety training, and actively cooperate with the injury incident handling, should be indicated on the label “spray drug use protective shield”.

It is reported that the Committee discussed 29 issues such as pesticides management, to stop the approval of chloropyrifos, triazophos in vegetable registration, to strengthen parasit management, to stop approval registration of glyphosate mixture AS with glyphosate ais less than 30%, environmental toxicity tests and assessment, and the registration issue of products using the same formula but different mixture ratio.

In H1 of 2012, accumulated production of technical pesticide products was 1,724,000 tons, increased by 21.7% over the same period of 2011, among which insecticides 395,000 tons, fungicides 73,000 tons, herbicides 788,000 tons, up -0.8%, -11.8% and 36.4% over the same period of 2011, respectively. High output of herbicide was driven by high demand for glyphosate and 2,4-D, etc.

1. Pesticide Production

According to the data released by the National Bureau of Statistics, the production of pesticide products in H1 of 2012 is shown as follows:

<table>
<thead>
<tr>
<th>Type</th>
<th>Output (1000t)</th>
<th>H1</th>
<th>Change (%)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>1724</td>
<td>21.7</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Insecticide</td>
<td>306</td>
<td>0.8</td>
<td>22.9</td>
<td>-8.3</td>
</tr>
<tr>
<td>Fungicide</td>
<td>73</td>
<td>-11.8</td>
<td>4.2</td>
<td>-2.0</td>
</tr>
<tr>
<td>Herbicide</td>
<td>788</td>
<td>36.4</td>
<td>45.7</td>
<td>3.7</td>
</tr>
</tbody>
</table>

It is shown from the table above that the imported and exported pesticide increased greatly. The imported pesticide amount was 38,700 tons, increased by 23.8%; the imported pesticide value reached $ 338 million, increased by 17.6%, the imported average price was $ 8,733.9/t, decreased by 5.2%. Among them, imported insecticide, herbicide and fungicide increased by 41.2%, 27.6% and 23.0%, respectively. The exported pesticide amount reached 473,200 tons, increased by 11.0%, the exported pesticide value reached $ 1,481 million, increased by 15.0%, and the exported average price was $ 3,129.8/t, increased by 4.2%. The amount of exported pesticides accounts for 27.4% of the total output. Among them, exported herbicides volume was 230,000 tons, increased by 17.8%, accounting for 67.7% of the total output, 40.6% of herbicide production. The exported herbicide value was $ 879 million; the average exported price was $ 3,745/t, increased by 4.2%. The exported fungicide was 37,200 tons, decreased by 5.2%, accounting for 7.9% of the total exported volume, 51.0% of fungicide production; the exported fungicide value reached $ 181 million, down 8.2%, the average exported price was $ 4,865/t, decreased by 6.5%.

2. Import and Export

According to the data released by the General Administration of Customs, pesticide import/export in H1 of 2012 is shown in table 2.

<table>
<thead>
<tr>
<th>Type</th>
<th>Amount (1000t)</th>
<th>H1</th>
<th>Change (%)</th>
<th>Value ($M)</th>
<th>H1</th>
<th>Change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insecticide</td>
<td>8.3</td>
<td>-2.1</td>
<td>37</td>
<td>-5.6</td>
<td>280</td>
<td>10.0</td>
</tr>
<tr>
<td>Fungicide</td>
<td>13.3</td>
<td>27.6</td>
<td>148</td>
<td>37.2</td>
<td>181</td>
<td>8.2</td>
</tr>
<tr>
<td>Herbicide</td>
<td>14.7</td>
<td>23.0</td>
<td>186</td>
<td>37.9</td>
<td>191</td>
<td>7.4</td>
</tr>
</tbody>
</table>

According to the data released by the Chinese Customs, glyphosate formulations sales of the Australian was about 65 million liters in 2011, of which manufactured or imported by Australian manufacturers, imports were mainly from China.

Australis Customs: China Glyphosate Dumping is Not True

August 2nd, 2012, the Australian Customs released the 2012/37 anti-dumping bulletin to announce the result of anti-dumping investigation: Chinese glyphosate formulators such as Wyuna do not dumping of the product under investigation, according to the relevant provisions of the Australian Customs Act 1901, to terminate anti-dumping investigations against Chinese glyphosate enterprises.

December 21st, 2011, two Australian companies sued Chinese glyphosate enterprises for dumping glyphosate. The Australian Customs issued the notice on February 6th. It said, according to the Cooperation of Nufarm and Ascenci Pty, they started anti-dumping investigation on Chinese glyphosate formulations. The products involved included glyphosate 360, Glyphosate 450, glyphosate 570 and glyphosate 660 formulations.

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According to the China Chamber of Commerce of Metals Minerals & Chemicals Importers & Exporters, a total of 297 enterprises in China exported of glyphosate formulations in 2011, of which 65 enterprises exported 46.8 thousand tons of glyphosate formulations to Australia, which just accounted for 6.3% of total glyphosate formulations.

In recent years, with glyphosate capacity expansion, China’s glyphosate export business gradually expanded while anti-dumping investigations increasing. China glyphosate formulators have been investigated by five countries and regions such as the Australia, Argentina, the European Union, US and Brazil.
This year, glyphosate continued to play the leading role in the market. Since the beginning of the year, the price of glyphosate rose slowly. So far it grew by 25%. Glyphosate manufacturers are generally in the performance of the previous orders, basically not in stock can be sold, resulting in higher prices on the market. The same time, foreign customers constantly asked orders, bringing a very strong signal of high market demand.

In order to be able to clearly understand the current situation of Chinese glyphosate market, Farm Chemicals interviewed with Mr. Luo Haizhang, president of China Crop Protection Industry Association, recently.

Q1 What is the current supply situation of glyphosate? Why is there short supply? What are the causes?

Since the beginning of the year, the price of glyphosate rose slowly. So far it grew by 25%. The market demand has exceeded the supply.

The main factors are:
1. China banned glyphosate AS with content below 30% which is prepared by glyphosate mother liquor. That implied higher environmental protection costs for glyphosate manufacturers and making the price increasing. In addition, many outdated companies were left due to the stringent environmental regulation, resulting in the output fell.

2. Since last year, market demand for chlorothiamethene reduced due to the recession of the organosilicon industry, leading to decline in the price of chlorothiamethene. As the byproduct, chlorothiamethene issue limits the output of glyphosate manufacturers with glycine device.

3. As the price fell in late of 2008, creating a downward spiral on profit for quite a while, many struggling small and medium-sized glyphosate manufacturers were left one by one. The inventory reduces while the output decreases.

So, the output fell significantly and inventory reduced in circulation due to high cost of production, in turn making the merchant replenishment leading to the price rebound. As merchants buy on the way up not on the way down, the product supply cannot keep up with the pace of price adjustment in a short time, resulting in such short supply.

Q2 In your opinion, why hasn’t the cost of glyphosate risen more drastically amid short supply?

The glyphosate price was low in a long period due to excess production capacity and inventory pressure. It was buyer’s market and the supplier was in destocking stage. Until this year, the price is rising again reasonable because of the production quantity is not sufficient. However, the price is not soaring for this shortage is not caused by increased market demand but the limited production capacity of the main manufacturers.

Q3 How long before new supply from Chinese producers become available to relieve the supply/demand discrepancy?

Crop planting is seriously affected by unusual drought in North American region in the first half year. So it is the shortage of storage which leads to the current unbalanced demand and supply relationship instead of growing market demand. As the manufacturers’ production capacity of glyphosate shall be updated after MBA and company restructuring, it is estimated that the current situation shall not last very long.

Q4 What is the Glyphosate Task Force’s role in the current situation?

In current situation, Glyphosate Task Force’ work are:
- To fully play the industry self-regulation role in regulating corporate behavior;
- To increase the production level and wastes treatment standards
- To fight against counterfeit goods and illegal production
- To keep the relevant administrative departments posted about the real situation of the industry, etc.
- To work together to maintain the order of the domestic and international markets
- To protect intellectual property rights, to promote the industry technology progress.

Since late July, northeast, north China area got frequent rainfall and moderate temperature, the climate conditions is suitable for armyworm’s intensive ingoing and occurring an harm. In early August, in Inner Mongolia, Hebei, Beijing, Tianjin, Shanxi, three generations of armyworm outbreak in succession, with the charactistics of large area, range, high density. And the agricultural production safety has been seriously threatened for corn, millet, rice. According to the preliminary statistics, there are more than 30 million acres of disaster through the country.

There are about 30 million mu of disaster area in Hebei, with the highest 2000 insects per 100 crops. The disaster area include Qinhuang, Jincheng, Yuncheng.

In addition, the disaster also happened in Heilongjiang, Jilin, Liaoning, Shandong and Guizhou. The number of insects reached 3000~4000 per 100 crops in Binzhou of Shandong.

At present, the preventive treatment of disaster has been up to the cordon (20 per square meter of rice, 120 per 100 crops of corn and broomcorn). Most of the lani-armyworm is between 3 to 4 years old, has entered the gluttony period, once carelessness on protection, huge harm will be happened on the production of autumn grain crops. Northeast and East China, as the disaster-happened area, the Eppo institutions must pay a great attention on the situation and trend, make clearly about the distribution area, the density of lani-armyworm and the prevention and control of key field, release the warning message in time, meanwhile the ponderance and the great threat of the disaster must report to the local government immediately.

Pesticides output up 3.5% in Jiangsu in H1 of 2012

According to Jiangsu Pesticide Association, total output value of 20 main pesticide enterprises reached Yuan 20.68 billion, of which Yuan 15.59 million billion belongs to pesticide business. Sales of pesticide reached Yuan 15.42 billion, while profit reached Yuan 986.6 million.

The volume of pesticide grew by 3.5% over the same period of previous year, of which insecticides, fungicides, herbicides, plant growth regulators and acaricides increased by -17.5%, 9.9%, 13.4%, -12.6% and -3.8%, respectively. Export value reached Yuan 2.78 billion.

For varieties, volume of glyphosate increased by 17.2%, while paraquat decreased by 12.9% due to the its use restriction. Detailed see table 1.

Three Generations of Armyworm Serious Outbreak in the Northeast and North China

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There are about 8 million mu of disaster area in Hebei Province, with the retransmission area for Tongliao and Chifeng. Among the Tongliao city, the area of many counties, there are 100~200 armyworms per 100 crops, the highest number is 400-650.

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In Baodi, Jixian, Jinghai and Hangu, there are about 9.86 million mu of disaster area in Shaxi, with the highest 2000 insects per 100 crops. The disaster area include Jincheng, Jincheng, Yuncheng.

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Wynca's high efficient utilization of organic phosphorus wastewater industrialization project was identified by CPCIF (China Petroleum and Chemical Industry Federation).

Wynca is known to set a 200,000 t/a wastewater device and two sets of 10,000 t/a hot polymerization, phosphate product purification through using the new technology. It is estimated, profit of Yuan 616 /t of glyphosate wastewater treatment is saved.

Global demand for glyphosate is about 500,000~600,000 t/a, with an annual growth of 10%. Preparation of one ton glyphosate through glycine produces 10~12 t wastewater and 4.5 tons mother liquor, which contains 0.5 ton organic phosphorus, was used to sell as 10% glyphosate AS. In June last year, MIIT banned 10% glyphosate AS product due to the environment protection issues. Glyphosate mother liquor is very complicated and difficult recovery in the high volume (1.35 million t/a), if not completely solve the issue; there will be the Achilles heel for domestic manufacturers.

For glyphosate mother liquor recycling, Wynca Group has invested Yuan 80 million in development of technology of high efficient utilization of organic phosphorus wastewater from 2005. Industrial technology includes wastewater with high content of phosphorus recovery and high efficient utilization. The company developed integration technology of oxidation - concentrated - directional transformation - phosphate purification for utilization of wastewater with high content of phosphorus. The waste conversion rate reaches to 96%~98%. The purified phosphate achieves industry product standards and the total comprehensive utilization rate of phosphorus resources exceeds 90%. Low phosphorus wastewater treatment integrated the technology of oxidation, micro-electrolysis, adsorption and chemical precipitation ensures the total phosphorus content of wastewater lower than 15 mg / L, which can discharge after further biochemical treatment.

Table 1. output changes of products in H1 of 2012

<table>
<thead>
<tr>
<th>product</th>
<th>usage t</th>
<th>product</th>
<th>usage t</th>
</tr>
</thead>
<tbody>
<tr>
<td>glyphosate</td>
<td>111,046</td>
<td>quinclorac</td>
<td>1,900</td>
</tr>
<tr>
<td>acetochlor</td>
<td>37,511</td>
<td>mesotrione</td>
<td>1,880</td>
</tr>
<tr>
<td>paraquat</td>
<td>10,784</td>
<td>fenoxaprop-p-ethyl</td>
<td>1,615</td>
</tr>
<tr>
<td>atrazine</td>
<td>30,667</td>
<td>pyrazosulfuron-ethyl</td>
<td>1,498</td>
</tr>
<tr>
<td>butachlor</td>
<td>19,750</td>
<td>lométryl</td>
<td>1,483</td>
</tr>
<tr>
<td>2,4-D butylate</td>
<td>3,789</td>
<td>pendimethalin</td>
<td>1,439</td>
</tr>
<tr>
<td>tolnoxafen</td>
<td>4,975</td>
<td>linuron</td>
<td>1,418</td>
</tr>
<tr>
<td>glyphosate-p-ethyl</td>
<td>3,525</td>
<td>haloxyfop</td>
<td>1,126</td>
</tr>
<tr>
<td>bentazone</td>
<td>2,763</td>
<td>isoproturon</td>
<td>1,114</td>
</tr>
<tr>
<td>benzonitrile-methyl</td>
<td>2,662</td>
<td>metobromox</td>
<td>1,084</td>
</tr>
<tr>
<td>alachlor</td>
<td>2,321</td>
<td>fl ozaprop</td>
<td>1,067</td>
</tr>
<tr>
<td>quizalofop-ethyl</td>
<td>3,525</td>
<td>fenoxaprop</td>
<td>1,054</td>
</tr>
<tr>
<td>2,4-D butylate</td>
<td>3,789</td>
<td>pendimethalin</td>
<td>1,049</td>
</tr>
<tr>
<td>fomesafen</td>
<td>4,975</td>
<td>sethoxydim</td>
<td>1,048</td>
</tr>
<tr>
<td>haloxyfop</td>
<td>1,900</td>
<td>isoproturon</td>
<td>1,036</td>
</tr>
<tr>
<td>bensulfuron-methyl</td>
<td>2,662</td>
<td>metobromox</td>
<td>1,027</td>
</tr>
<tr>
<td>trimethaphos</td>
<td>2,354</td>
<td>quizalofop</td>
<td>1,024</td>
</tr>
<tr>
<td>alachlor</td>
<td>2,321</td>
<td>benzonitrile</td>
<td>1,018</td>
</tr>
</tbody>
</table>

According to statistics, in 2010 domestic herbicide use in production agriculture increased by 16% to 96,200 tons, accounting for 31.9% of the 301,000 tons of the total use of pesticides in production agriculture. For herbicides use, grain loss of 21.57 billion Kg, cotton loss of 290 million Kg, oil loss of 1,090 million Kg, apple loss of 410 million Kg, orange loss of 650 million Kg and vegetable loss of 5580 million Kg were saved. Herbicides can efficiently control the weed in farmland, play an important role in China's agricultural production, agricultural structure adjustment and rural labor force transformation.

1 herbicide usage has increased year by year

Domestic demand for herbicide is expected to grow by 140% to 98,100 tons in 2012 over the year of 2000. For varieties, demand for sulfonylurea, amides, glyphosate and paraquat increased considerably. Among them, demand for quizalofop-p-ethyl, bensulfuron-methyl, pyrazosulfuron-ethyl and Nicosulfuron boosts by 410% to 14,100 tons in 2012 over 2,718 tons in 2000; demand for acetochlor, butachlor, alachlor and metolachlor grows by 97.4% to 63,700 tons in 2012 over 32,200 tons in 2000; demand for glyphosate grows by 97.3% to 100,700 tons in 2012 over 50,900 tons in 2010; demand for paraquat boosts by 470% to 32,200 tons over 5,648 tons in 2000.

Over the recent 11 years, China's herbicide use in production agriculture is some 38,400 tons in 2000 and 96,200 tons in 2010 (off 100%, the same below), accounting for 15.4% and 31.9% of the total amount of pesticides use in production agriculture, respectively.

2 The use amount of herbicides

2010, China's widely used herbicides includes: glyphosate of 111,001 t (the amount of formulation, the same below), acetochlor of 37,500 t, paraquat of 30,700 t, atrazine of 20,600 t, butachlor of 15,700 t, 2,4 - butylate of 8,789 t, fomesafen of 4,975 t, MCPA of 4,081 t, quizalofop of 3,525 t, bensulfuron of 2,662 t, tribenuron of 2,354 t, quinclorac of 1,900 t and nicosulfuron of 1,680 t (table 1).
Sanonda sales up 12.1% in H1

Sanonda posted a rise of 12.1% in revenue to Yuan 1,116 million. While its operating profit decreased by 13.6% to Yuan 6.1 million.

<table>
<thead>
<tr>
<th>H1 of 2012</th>
<th>H1 of 2011</th>
<th>Change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>sales</td>
<td>1,116.8</td>
<td>996.3</td>
</tr>
<tr>
<td>Operating profit</td>
<td>41.8</td>
<td>42.9</td>
</tr>
<tr>
<td>Total profit</td>
<td>36.1</td>
<td>36.1</td>
</tr>
</tbody>
</table>

Sanonda pointed out that the overall profitability of the company is difficult to ascend, the main factors are: the world economy remains in the doldrums, the pesticide industry overall capacity is still oversupply; the international pesticide companies accelerate the pace of entering the domestic market; higher price of chemical raw materials and energy; the continuous stringent environmental regulatory.

Veyong Biochemical profit boosted in H1

Hebei Veyong Bio-Chemical Co., Ltd. posted a 50% rise in net profit attributable to shareholders of listed company to Yuan 22.1 million in first half of year.

Veyong pointed out that key factors were: the implementation of the technology research to promote the cost of synthesis slowed down; higher downward pressure on the domestic and international economic operation; the pesticide industry overall capacity is still oversupply; the international pesticide companies accelerate the pace of entering the domestic market; higher price of chemical raw materials and energy; the continuous stringent environmental regulatory.

Sales of Wynca ups 22.1% in H1

Sales of Wynca increased by 22.1% to Yuan 2,968.9 million. The company suffered losses due to the downtown in organosilicon, the total profit loss Yuan -29.4 million and net profit attributable to shareholders of listed companies reached Yuan 27.7 million.

<table>
<thead>
<tr>
<th>H1 ended by Jun 30th</th>
<th>H1 of 2012</th>
<th>H1 of 2011</th>
<th>Change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>sales</td>
<td>2,969</td>
<td>2,431</td>
<td>+22.11</td>
</tr>
<tr>
<td>Operating profit</td>
<td>411</td>
<td>13</td>
<td>+2,988</td>
</tr>
<tr>
<td>Total profit</td>
<td>29</td>
<td>73</td>
<td>-140.18</td>
</tr>
</tbody>
</table>

Sales in domestic and overseas increased considerably due to the high demand for glyphosate and additional 100,000 t/a organosilicon production capacity, the total production capacity of organosilicon reaches 200,000 t/a.

In the first half of 2012, the company faced with complex internal and external business environment. Demand for the company’s leading products, glyphosate increased considerably after downtown for quite a while. Due to overcapacity, company’s another main product, organosilicon remains in the doldrums.

The second half of year, the company will continue to promote profitability of glyphosate products and strengthen quality of the silicone downstream products.
Yangnong Chemical: Glyphosate Turnround in H1

Nanjing Yangnong Chemical Co., Ltd., the largest Chinese producer of glyphosate, reported a significant turnaround in the first half of 2012, as its sales and profits improved dramatically. The company's sales for the first half of 2012 increased by 31.2% to Yuan 1,380.3 million, up from Yuan 1,061.6 million in the same period of 2011. Operating profit improved by 30.4% to Yuan 196.8 million, and net profit rose by 58.6% to Yuan 116.1 million. The company's gross profit margin improved to 14.3% from 12.0% in the first half of 2011.

The company attributed its strong performance to the increased demand for glyphosate in the global market, driven by higher crop prices and a stronger global economy. The company also benefited from its efforts to control costs and improve efficiency. Yangnong Chemical is a leading manufacturer of glyphosate in China, with a market share of around 30%. The company plans to continue its expansion strategy, focusing on new markets and product development to sustain its growth in the future.

Nanjing Redsun’s Pesticide Sales Boosted in H1

Nanjing Redsun Co., Ltd., the leading Chinese producer of pesticides, reported a strong performance in the first half of 2012, with sales and profits increasing significantly. The company's sales for the first half of 2012 amounted to Yuan 1,380 million, up from Yuan 1,112.9 million in the same period of 2011, representing a growth of 15.0%. Operating profit increased by 30.5% to Yuan 141.6 million, and net profit rose by 36.4% to Yuan 102.7 million. The company's gross profit margin improved to 10.3% from 8.9% in the first half of 2011.

The company attributed its strong performance to the increased demand for its products, particularly in the South American market, driven by higher crop prices and stronger market conditions. The company also benefited from its efforts to control costs and improve efficiency. Nanjing Redsun is a leading manufacturer of pesticides in China, with a market share of around 15%. The company plans to continue its expansion strategy, focusing on new markets and product development to sustain its growth in the future.
Lier's sales boosted in H1

Lier Chemical recently posted a 38.25% rise in revenues in the first half to Yuan 605 million (Table 1). Profit grew by 8.32% to Yuan 68.7 million. Net profit attributable to shareholders of listed companies decreased by 6.3% to Yuan 44.8 million.

Among them, the company’s main chemical pesticides sales grew by 37.9% to Yuan 603 million (Table 2). Pesticide technical sales increased by 51.3% to Yuan 418 million, accounting for 66.30% of the total revenues of chemical pesticides. Sales of formulations and other products reached Yuan 185 million, with an increase of 14.94%. By region (Table 3), domestic sales accounted for 37% of total sales, with an increase of 15.78%; international market sales reached Yuan 379 million, up 55.47%.

The company is expected net profit attributable to shareholders of listed companies in the first 9 months will reach Yuan 721.7 million, to be flat last year. The company pointed out that the key factors in good performance in H1: higher demand; the technological transformation of the main product line to improve the productivity; acquiring Jiangsu Kuaida Agrochemical Co., Ltd..

In addition, the Board of Directors examined and approved the motion on the technological transformation of the clopyralid production lines and facilities expansion. The board agreed to invest Yuan 55.6 million to carry out technological transformation expansion on clopyralid technical production line. On the occasion, the company clopyralid technical production capacity will reach to 70.28 million, to be flat last year. The company pointed out that the key factors in good performance in H1: higher demand; the technological transformation of the main product line to improve the productivity; acquiring Jiangsu Kuaida Agrochemical Co., Ltd.

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Due to industry recovery and all projects up and running, the company expects to see profit of Yuan 106-133 million attributable to shareholders of listed companies in first three quarters this year, grew by 20-50%.

In addition, its subsidiary Nantong plant will develop some technical production projects in batches. Of which 2000 1/ 4 dicamba production line is expected to start production in April 2013. Dicamba is a selective herbicide, mainly used for the control of upland grass weeds. Due to the current crop resistance to glyphosate, dicamba and glyphosate generally mixed use. In recent years, a number of international giants develop the new GM crops, including dicamba-tolerant crops, which are expected to be pulling the increase in demand for dicamba. The company expects the project will increase annual sales of Yuan 200 million, net profit of Yuan 21.21 million from the production project. Changing shows optimistic about the product in Nantong, and expects to double the revenue on the previous year of 2011. Changing is mainly engaged in the production and sale of chemical pesticides, and its products include over 20 kinds of AI and over 70 kinds of formulations, which cover herbicides, insecticides and fungicides with highly efficient, low toxicity and low-residue. The company already has 11 authorized patents for inventions.

For H1 ended by Jun 30th H1 of 2012 H1 of 2011 Change (%)

<table>
<thead>
<tr>
<th>sales</th>
<th>604.7</th>
<th>590.9</th>
<th>6.17%</th>
</tr>
</thead>
<tbody>
<tr>
<td>operating profit</td>
<td>48.0</td>
<td>43.3</td>
<td>9.96%</td>
</tr>
<tr>
<td>total profit</td>
<td>68.7</td>
<td>63.4</td>
<td>8.32%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>region</th>
<th>sales</th>
<th>Change(%)</th>
<th>Rate of margin(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>domestic</td>
<td>384.6</td>
<td>16.4%</td>
<td>21.53%</td>
</tr>
<tr>
<td>overseas</td>
<td>220.1</td>
<td>7.69%</td>
<td>25.37%</td>
</tr>
<tr>
<td>total</td>
<td>604.7</td>
<td>6.17%</td>
<td>21.57%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>product</th>
<th>sales</th>
<th>Change(%)</th>
<th>Cost</th>
<th>Change(%)</th>
<th>Operating margin</th>
<th>Change(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>pesticide 599.4</td>
<td>40.69</td>
<td>470.7 42.29</td>
<td>21.47</td>
<td>3.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>construction 3.3</td>
<td>69.42</td>
<td>3.0</td>
<td>55.22</td>
<td>8.57</td>
<td>8.36</td>
<td></td>
</tr>
<tr>
<td>technical 417.9</td>
<td>22.9</td>
<td>31.89</td>
<td>4.21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>formulation 155.2</td>
<td>20.63</td>
<td>14.94</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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In the first half of 2012, due to the back-of-in-demand for pesticide, low price of raw materials and mergers company, sales of Huifeng boosts by 83.2% to Yuan 714.2 million, EBITDA increases by 43.8% to Yuan 47.7 million.

### Huapont’s pesticide sales boosted

Huapont pharmaceutical posted a 53.3% rise in revenue of Yuan 1,811 million in the first half of the year, the company’s operating profit and net operating profit attributable to parent company climbed up by 39.5% and 39.3% to Yuan 252 million and Yuan 230 million, respectively. Of which, EBITDA reached Yuan 153 million.

| Table 1 sales of Huapont in H1 of 2012 (Yuan million) |
|-----------------|------------|-----------------|-----------------|
| H1 ended by Jun 30th | H1 of 2012 | H1 of 2011 | Change (%) |
| sales | 1,811 | 1,293 | 40.5% |
| EBITDA | 153 | 103 | 49.5% |
| Operating profit | 252 | 183 | 43.0% |
| EBIT | 230 | 166 | 38.7% |

By products, sales of pesticides and intermediates boosts by 79.6% due to mergers and greater volume. Low rate of margin of the merged company’s insecticide business dragged the company’s margin rate down by 25.7%. Margin rate growth of 6.03% fungicide was driven by the stable price and lower cost. But the margin rate of intermediate fell by 17.4% due to the low price.

### Pesticide sales of Lianhe ups 26%

Zhejiang Lianhe Chemical Technology Co., Ltd. posted a 20.15% rise in revenue of this year to Yuan 1,482 million. Industrial business revenue grew by 27.0% to Yuan 1,028 million on the previous year. Due to the stable growth of old products and fast development of new products, its pesticide intermediates business saw growth, and the revenue grew by 26.4% to Yuan 756 million. Pharmaceutical intermediates business saw flat, and revenue decreased by 0.8% to Yuan 144 million. Its net cash flow boosted by 246.98% to Yuan 23.4 thousand due to more efficient management.

| Table 1 sales of Lianhe in H1 of 2012 (Yuan million) |
|-----------------|------------|-----------------|-----------------|
| revenue | 1,482 | 1,223 | 20.15% |
| Operating profit | 246 | 198 | 24.11% |
| EBITDA | 234 | 180 | 35.58% |

### Sales of Shenghua Decline Dramatically

Sales of Shenghua Biok decreased by 15.2% to Yuan 821.2 million. Net profit attributable to shareholders of listed company, and EBITDA fell by 56.5% and 61.7% to Yuan 31.5 million and Yuan 26.2 million, respectively. It is estimated, Jan-Sep of 2012, net profit attributable to shareholders will decrease by 50% over the same period last year.

| Table 1 Shenghua Biok’s result (Yuan million) |
|-----------------|------------|-----------------|-----------------|
| H1 ended by Jun 30th | H1 of 2012 | H1 of 2011 | Change (%) |
| sales | 821.2 | 985.7 | -15.16 |
| Operating profit | 31.5 | 88.9 | -63.36 |
| EBITDA | 31.5 | 88.9 | -63.36 |

### Outlook

Lianhe Chemical’s most of intermediates corresponding pesticides and pharmaceutical are in patent period with higher added value and price stability. While this year, the depressed prices of raw materials makes the company’s gross margin increase to 28.21%, and it is expected to maintain positive growth.

In addition, the company accelerated the planning and construction of key projects. Three pesticide intermediates projects, including 300 t/a of fenoxycarb-zinc, 500 t/a of 5-amino-3-4’-5’-trifluorobiphenyl, and 300 t/a of substituted-succinamide production plant project have been completed, and will provide the strong support for the growth of H2 of this year. The company expects the net profit to grow 20%-50% in first three quarters.

The company projects under construction also includes the 300 t/a of fenoxycarb-zinc, 300 t/a of fungicide intermediate, 200 t/a of aminocyclopyrachlor and 20,000 t/a of phosgene production unit.

### Table 2 Main Pesticide sales of Huapont in H1 of 2012 (Yuan million)

<table>
<thead>
<tr>
<th>Product</th>
<th>sales</th>
<th>Operating profit</th>
<th>Rate of margin (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insecticide</td>
<td>288.8</td>
<td>63.6</td>
<td>22.1%</td>
</tr>
<tr>
<td>Pesticide</td>
<td>1,471</td>
<td>269</td>
<td>18.2%</td>
</tr>
<tr>
<td>Intermediate</td>
<td>987</td>
<td>285</td>
<td>28.9%</td>
</tr>
</tbody>
</table>

### Table 3 sales by region (Yuan million)

<table>
<thead>
<tr>
<th>Region</th>
<th>sales</th>
<th>Change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>domestic</td>
<td>844.2</td>
<td>79.89%</td>
</tr>
<tr>
<td>overseas</td>
<td>212.1</td>
<td>18.88%</td>
</tr>
</tbody>
</table>

### Table 4 sales by region (Yuan million)

<table>
<thead>
<tr>
<th>Region</th>
<th>sales</th>
<th>Change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>domestic</td>
<td>404.9</td>
<td>-10.91</td>
</tr>
<tr>
<td>overseas</td>
<td>403.4</td>
<td>-20.54</td>
</tr>
</tbody>
</table>

In the first half of year, the company actively promote the construction of various fund-raising projects, including the 3000 t/a prochloraz project, 1000 t/a epochinazoine projects, 13,000 t/a formulations, GLP laboratory and marketing center construction project in Shanghai. The company accelerates the project construction, to ensure that the project completed at the end of year, and is dedicated to introduction and R & D on high efficient, low toxicity, new varieties of pesticides, to optimize product structure and improve product quality. The company already has 21 authorized patents and 14 products registration in the reporting period.
Glyphosate boosts Huaxing H1

Huaxing sales grew by 5.7% to Yuan 516 million in the first half of the year due to company’s brand advantages, vigorously adjustment of product structure, expansion of domestic market and improvement of international market. Pesticide sales reached Yuan 485 million, with an increase of 5.24% compared to the same period last year, accounting for 93.94% of the company’s total revenue. The fungicide achieved the highest growth of 77.98%. insecticides is still the largest product categories in terms of revenue, its sales of Yuan 214 million accounted for 44.2% of total pesticide sales. It noted that sales of seed doubled in the first half of year, with an increase of 222.94%.

Company’s pesticide revenue grew up 12.6% to Yuan 842 million. Among them, glyphosate business grew up 24.1% to Yuan 738 million, accounting for 88% of total pesticide revenue, sale of dichlorvos increased by 11%.

Jiangshan’s glyphosate business up 24% in H1

Jiangshan posted a 12.7% rise to Yuan 1,470 million in the first half of year, which is driven by more glyphosate export and higher revenue & profit of most products. The profit exceeded Yuan 900 million in the first half of year.

Company’s pesticide revenue grew up 12.6% to Yuan 842 million. Among them, glyphosate business grew up 24.1% to Yuan 738 million, accounting for 88% of total pesticide revenue, sale of dichlorvos increased by 11%.

Outlook

The company is expected that it will achieve profitability in net profit in the 800-1300 million during the first 9-month of the year.
Welcome to 12th National Pesticide Exchange Meeting

AgroChemEx is an annual agrochemical symposium and exhibition organized by the China Crop Protection Industry Association (CCPIA) that takes place in Shanghai. Founded in 1982, the CCPIA, with its 500 plus members, has become a major force in China’s crop protection industry. The event attracts over 500 domestic exhibitors, specializing in technical, formulation and adjuvants, who together account for 80% of China’s pesticide output. By attending AgroChemEx, you will have the opportunity to meet the top producers in China and get to know their brands.

2012 International Forum on the Procurement & Services of Crop Protection Products and Conference on Crop Protection Science & Technology, in parallel with Agrochemex 2012, organized by China Crop Protection Industry Association, will be held at Shanghai Everbright International Hotel on October 20th, 2012. The events will cover marketing, new legislation and new data requirements as well as innovation and technology, improving the planning season for Chinese manufacturers.

October 19th-21th, 2011
Shanghai Everbright Convention and Exhibition Center

Why attend
• To meet with top decision-makers of Chinese agrochemical enterprises
• Best season: a guarantee for good price because autumn is the planning season for Chinese manufacturers
• To find the ideal suppliers easily through our Procurement Matchmaking Program & Manufacturer List

Register now at: www.ccpia.org.cn/en
AgrochemEx2012 agenda

AgrochemEx 2012 is open from 9:00am on Friday 19 October 2012 until 17:30pm on Monday 22 October 2012

Time | Exhibition | Symposium
--- | --- | ---
Friday 19th October 2012 08:00-17:30 | Ball Convention Only | 27th National Agrochemicals Exchange Meeting (Chinese)
Saturday 20th October 2012 08:00-17:30 | Show open | 2012 International Conference on Crop Protection (Simultaneous Translation)
Sunday 21st October 2012 08:00-17:30 | Show open | 2012 China International Forum on Procurement and Service of Pesticides (Simultaneous Translation)
Monday 22nd October 2012 08:00-17:30 | Show open | 2012 Popular Commodities Forum (Chinese)

2012 International Conference on Crop Protection

Time 08:00-16:00, 2012-10-20
Venue: Guang Yang No.1, Shanghai Everbright International Hotel

<table>
<thead>
<tr>
<th>Topic</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>The future role of crop protection technologies</td>
<td>Dr. Phil Lane, vice president of fungicide R&amp;D, BASF</td>
</tr>
<tr>
<td>The research and marketing of new molecules</td>
<td>Dr. Qi Li, Manager of Research Institute of Crop Protection</td>
</tr>
<tr>
<td>FMC Open Innovation Model – A Win-Win Situation with Our Business Partners</td>
<td>Dr. Henry Ho, Managing Director, Global Innovation &amp; Technology Acquisition, Asia, Agricultural Products, FMC Corporation</td>
</tr>
<tr>
<td>Research Strategy and Thinking of Chinese Agrochemical Discovery</td>
<td>Dr. Luan Zhang, Shenyang Chemical Industry Research Institute</td>
</tr>
<tr>
<td>Reducing Plant Pest Control Product Cross Contamination Risk</td>
<td>Dr. Mark Clark, Former Global Director of Environmental Health Safety and Quality for Dow AgroSciences</td>
</tr>
<tr>
<td>Chemical Reaction Risk Studies and Technical Risk Evaluation</td>
<td>Dr. Zhong Cheng, Shenyang Chemical Industry Research Institute</td>
</tr>
<tr>
<td>Innovation: the way to clinch big challenges in agriculture</td>
<td>Dr. Claude Lambert, Bayer CropScience, Development Manager Asia Pacific</td>
</tr>
</tbody>
</table>

2012 China International Forum on Procurement and Service of Pesticides

Time 08:00-17:30, 2012-10-20
Venue: Guang Yang Yu No. 1, Shanghai Everbright International Hotel

<table>
<thead>
<tr>
<th>Topic</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>The USA Agrochemical Marketplace – Strategies for Chinese Companies</td>
<td>Ms. Theresa Thorley, President &amp; Joint Owner of Engage Agro USA LLC</td>
</tr>
<tr>
<td>The importance of technological innovation: an engine for the future</td>
<td>Mr. Li Ming, President of Shanghai Technology</td>
</tr>
<tr>
<td>Chinese Agrochemical Manufacturers Going Downstream in International Markets – Adopt Seventieth Century</td>
<td>Ms. C. S. Law, Managing Director Pacific Agroscience Pte Ltd, Singapore</td>
</tr>
<tr>
<td>The registration of pesticides in the EU</td>
<td>Mr. Yi, President of Sino/AgI Leading Biosciences Co. Ltd</td>
</tr>
<tr>
<td>Latin American Markets and Regulations: a Brazilian perspective</td>
<td>Mr. Tarciso Mauro Bonachela, Corporate Negotiations &amp; Regulatory Affairs Director</td>
</tr>
<tr>
<td>Sustainability of 2,4-D in the rigorous new world regulatory environment</td>
<td>Dr. Daniel Erasmus, Global Business Leader for the Commodity Herbicides portfolio, Dow AgroSciences LLC</td>
</tr>
<tr>
<td>A Roadmap for Entering the USA Marketplace: Registration and Marketing</td>
<td>Mr. Trevor Thorley, President &amp; Joint Owner of Engage Agro USA LLC</td>
</tr>
<tr>
<td>The USA Agrochemical Marketplace: A Roadmap for Entering the USA Marketplace: Registration and Marketing</td>
<td>Dr. Hong Chen, Director International Affairs, Technology Sciences Group Inc. (TSG)</td>
</tr>
<tr>
<td>The future roles of crop protection technologies</td>
<td>Dr. Arthur L. (Artie) Lawyer, President, Technology Science Group Inc. (TSG)</td>
</tr>
</tbody>
</table>

A Roadmap for Entering the USA Marketplace: Registration and Marketing

Time 13:00 – 17:30, 2012-10-20
Venue: Guang Yang Yu No. 1, Shanghai Everbright International Hotel

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:00-13:10</td>
<td>Brief Introduction</td>
<td>Dr. Chen, A. Lawyer</td>
</tr>
<tr>
<td>13:10-13:40</td>
<td>The USA Agrochemical Marketplace: Strategies for Chinese Companies</td>
<td>Dr. Theresa Thorley</td>
</tr>
<tr>
<td>13:40-14:10</td>
<td>Decisions on Registration and Regulatory Standards</td>
<td>Arthur L. (Artie) Lawyer</td>
</tr>
<tr>
<td>14:10-14:50</td>
<td>Decisions on Number of Entry into USA Market</td>
<td>Dr. Chen, A. Lawyer</td>
</tr>
<tr>
<td>15:50-16:10</td>
<td>Roadblocks for New and “Me-too” Registration Approvals</td>
<td>Dr. Chen, A. Lawyer</td>
</tr>
<tr>
<td>16:10-16:50</td>
<td>Strategies for Chinese Companies to Enter USA Market</td>
<td>Dr. Chen, A. Lawyer</td>
</tr>
<tr>
<td>17:00-17:20</td>
<td>Questions</td>
<td>Dr. Chen, A. Lawyer</td>
</tr>
</tbody>
</table>

Outlines
1. Significance
2. Discovery of Antiphyllovirus based on the major agricultural diseases and pests
3. Application technology research and demonstration of novel antiphyllovirus
4. Development of new environment-friendly formulations
5. Technology research and application of novel variety combined with ecological prevention and control
6. Conclusions

Zhang Yibin
Senior engineer of Shanghai Pesticide Research Institute

Topic: Popular pesticide varieties last 5 years and their profiling

Abstract: According to the statistics, there are some 225 of herbicides, 159 of insecticides and 146 of fungicides in 564 varieties of pesticides. Among them, 122 of pesticides, of which growth rate of average annual sales exceeded 10%, accounting for 21.6% of total pesticides.

In 122 pesticides, there are some 43 of herbicides, 34 of insecticides, 39 of fungicides and 6 of others, accounting for 35.25%, 27.87%, 31.97% and 5.0% of 122 varieties, respectively. Among them, some 33 of pesticides, of which sales exceeded $100 million, accounting for 27% of 122 varieties.
C.S. Liew
Managing Director of Pacific Agriscience Pte Ltd, based in Singapore, has had 33 years of international experience in the agricultural chemical industry. He has worked for American Cyanamid, Ciba-Geigy, Uninoyal and Nufarm before forming his own company 13 years ago. His roles and experience cover a wide spectrum including R&D, Product and Market Development, Market Research, Product Registration, Sales and Marketing, as well as senior management roles at directorship level. C.S. Liew has also formed and participated in several joint venture companies in South Africa, Middle East, New Zealand, Australia, USA, and Thailand. His latest exciting project is marketing agchem products directly to farmers in Australia under an F2F (Factory to Farm) business model.

Daniel Erasmus
Global Business Leader for the Commodity Herbicides portfolio in Dow AgroSciences LLC.

He obtained a PhD in Botany from the University of Natal, South Africa in 1986 and after nearly two decades of weed science research in South Africa’s Department of Agriculture and Agricultural Research Council, he entered the private sector in 1995. Following three years of R&D, regulatory and commercial roles and intensive exposure to the Eastern Europe and the Middle East markets, he moved to Dow AgroSciences where for the past 14 years he has served in several global roles including regulatory and marketing. The Commodity Herbicides portfolio for which he is currently responsible includes glyphosate and 2,4-D herbicides. He has been extensively engaged in leading the development and positioning of the chemistry solutions for Dow AgroSciences’ Enlist Weed Control System.

Sustainability of 2,4-D in the rigorous new world regulatory environment
Li Weiguo
Senior engineer
Chairman of the board of Guangxi Tianyuan Biochemical Co., Ltd

Outline:
Pay more attention to technological innovation, to install an engine for the enterprise

Achievement of independent technological innovation is the only way for domestic pesticide companies to become bigger and stronger.

Introduction on Tianyuan’s exploration and reflection of technology innovation.

Su Yi
President/general manager of Sino-Agri leading biosciences co., ltd

Mr. Su Yi graduated from JILIN Agricultural University, Department of Chemistry. He joined into Sino-agri in 1992, was engaged in agrochemical management for almost 20 years, served Sino-Agri leading biosciences co., ltd as vice general manager and general manager. Currently, he is president & general manager of Sino-Agri leading biosciences co., ltd. Meanwhile, he was employed as a member for the Ministry of Agriculture Pesticide Review Committee, as an expert for Pesticide management, the Ministry of Information Industry, as an executive director for China crop protection industry association and as vice president for China Association of Pesticide Development & Application.

Broa vision needed for pesticide management

Claudio Mereu
Claudio Mereu is a partner at the law firm Field Fisher Waterhouse LLP where he focuses on EU law with an emphasis on pesticides, biocides and chemicals. Claudio advises companies on product registration and regulatory compliance issues at both EU and national levels, Task Force and consortia formation, product defense strategies, data sharing, compensation and related arbitration proceedings across the EU, as well as related antitrust issues. He has also extensive experience in litigation before European and national courts regarding product approvals and counsels companies on a wide range of business law matters regarding their commercial agreements in Europe. He is a regular speaker on these topics at major conferences and is recommended as a leading practitioner in his areas of expertise by “Global Counsel - Life Science Industry Report”, “Chambers Europe”, “Legal 500” and “Who’s Who Legal”.

The registration of pesticides in the EU
The specific topic of the presentation will include the following:
1) overview of the regulatory system for pesticides in the EU;
2) getting a pesticide registered in the EU;
3) data sharing and mutual recognition of product registrations.
4) review the most popular pesticides in the current market in EU

Phil Lane
Vice president, BASF
The future roles of crop protection technologies

A plant physiologist by training he studied for his first degree in Biological Sciences at the then Wolverhampton Polytechnic (1973-6) and for his PhD at University College of Wales, Aberystwyth as a student of the late Professor Wareing (1976-9) working on the role of cytokinins in apical dominance. In 1979 began at Shell Research Sittingbourne working on PGIs until 1987 when he switched to herbicides. Following two years in Ireland running a Shell Company producing microbial products for waste water treatment...
(1990-2) moved to Shell Forschung in Schwabenheim, Germany as Head of Biology focusing mainly on herbicides and fungicides. Remained in Schwabenheim when ownership changed to American Cyanamid and eventually took over responsibilities for the Discovery programme at Schwabenheim. In 2000, moved to BASF, following its takeover of American Cyanamid’s business, initially as Head of Biological Research and from 2003 as Head of Fungicide Research & Development.

**Henry Liu**
Ph.D. Managing Director
Global Innovation & Technology Acquisition, Asia Agricultural Products, FMC Corporation

**Global Innovation and Technology Acquisition, FMC Agricultural Products**

I. FMC Growth Strategy – Vision 2015
II. New Asia Innovation Center in Shanghai – An Asian hub to better support its Vision 2015 roadmap
III. Open Innovation Model – Making strategic alliances to create win-win business opportunities

**Zhang Lixin**
Dr. Lixin Zhang received his PhD degree in 2004 from the University of Leeds. After a year of postdoc experience at the SOMS, he joined pharmaceutical industry and is currently working on developing new drugs. Prior to starting his PhD, Dr. Zhang was a senior engineer in Shenyang Research Institute of Chemical Industry and led a number of fungicidal research projects leading to the discovery of SYP-Z071, SYP-Z048 and SYP-1620 which are all commercialized by the institute.

**R&D strategy and thought of discovery of pesticide in China**

The author has been engaged in discovery of pesticide products since early 90s. He, as the primary contributor, discovered SYP-2071, SYP-2048 and SYP-1620 which are formally registered now. He analyses advantages and disadvantages at the discovery of new pesticides and suggests intellectual property of new active ingredients is a key factor during the commercialisation. In addition to R&D of active ingredients, new formulators, mixtures, objectives and cost also deserves attention during the development of new products.

Specifically, Dr. introduces medical innovation mechanism into pesticides in aspects of structure, ligand and fragment-based drug design and carries comparative studies between the medical and pesticide mechanisms. He also stresses on the influence of compound’s physical nature on systemic and conduction mechanism, as well as lipophilicity on activity, toxicity, degradation, and environment. He also states the post development stage towards innovative products and the usage of pesticidellikeness to guide the discovery and optimism of lead compounds.

The Chinese new chemical products can also have infinite opportunities in global market. Different types of companies can have different market opportunities. Small-size companies can be creative and export its intellectual property, which has been testified in medical enterprise. The domestic situation is favorable on price and environment. He also states the post development stage towards innovative products and the usage of pesticidellikeness to guide the discovery and optimism of lead compounds.

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**Chemical Reaction Risk Studies and Technical Risk Evaluation**

Safety production is vitally important to the survival of enterprises. Chemical reaction risk studies and technical risk evaluation are important to safe production. Fine chemical production first begins in the western countries, and fine chemical risk studies then are carried on by world leading enterprises after a series of accidents and lessons. However, in China this type of studies is still in its initial stage.

**Main Content**
- Substance risk studies
- Reaction risk studies
- Environmental risk studies
- Reaction risk evaluation

**Li Bin**
Professor
Shenyang research institute of chemical industry Co. Ltd, Sinochem, China

Bin Li obtained his bachelor’s degree in chemistry in 1986 at Inner Mongolia University. He obtained master’s degree in applied chemistry at Shenyang research institute of chemical industry in 1989 supervised by Prof. ZaiSu Bai and got his doctor’s degree in agrochemicals in 2005 at Nankai university supervised by Prof. HuaZheng Yang.

He has been working in Shenyang research institute of chemical industry since 1989, responsible for design and synthesis of new organic molecules for biological activity screening.

Seventy patent applications on agrochemicals discovery have been filed and thirty of them have been granted.

**The research and development progress of new insecticides**

The research and development of new insecticides has showed significant progress in recent years. This presentation will give a brief introduction to the insecticides launched recently or in the registration stage. The structures, biology, IP, and synthetic methods of the following insecticides will be covered: pyridialyl, flometosin, silvchongxianan, flonicamid, pyriflumiquin, spirodienone, cyantraniliprole, sulfosafuran, flupyradiflorane, cyflumetofen, cyenopyrafen, pyflubumide.
Dr. Claude Lambert  
Bayer CropScience, Development Manager Asia-Pacific

Born in Belgium, Claude Lambert studied organic chemistry in the universities of Louvain (Belgium) and Kyoto (Japan). He joined Rhone-Poulenc (Aventis) in 1985 and occupied several research positions in France, United Kingdom and Japan until the acquisition of Aventis CropScience by Bayer. From 2003 until 2011, he was head of research and development of BayerCropScience Japan and moved to Singapore in the early 2012 where he is in charge of the crop protection development activities for the Asia Pacific region.

Innovation, the way to conquer challenges in agriculture

Abstract: Feeding the people of the 21st century is the task of all organizations involved in agriculture, food production and distribution. Agriculture must supply more and better produces in shrinking agricultural areas, with dramatic environmental changes, while farmers in most countries struggle for decent revenues.

In this presentation, we will show how Bayer contributes to these challenges through innovation and creation of added value to the farmers. We will show examples of our discovery processes and the integration of farmers in designing better crop production schemes.

DuPont picoxystrobin approved temporary registration in China

Recently, DuPont's strobilurin fungicide picoxystrobin technical and its formulation approved the temporary registration by ICAMA. The formulation, 22.5% picoxystrobin SC used in control of leaf spot, black spot on banana and gummy stem blight, anthracnose on watermelon.

Picoxystrobin is a systematic fungicide, inhibiting fungal respiration and has both preventative and curative properties, mainly control of yellow, brown and crown rusts, powdery mildew, sooty mould, black spot and tan spot on cereal crops with improved curative properties compared to azoxystrobin in certain crops.

Picoxystrobin was initially introduced by Syngenta in Europe in 2001. In 2006, this product was sold to DuPont in return for access to the insecticide chlorantraniliprole for use in mixtures.

Picoxystrobin is a systemic fungicide that is registered in many countries, including: Argentina, Austria, Belgium, Brazil, Colombia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Kenya, Latvia, Lithuania, the Netherlands, New Zealand, Norway, Poland, Romania, Slovakia, South Africa, Sweden and the UK. Registration is ongoing in the US, Italy and Portugal. DuPont has expected its peak for picoxystrobin to be $150 million/a.

Initial registration of thiamethoxam technical product approval

Recently, Huludao Linyung Pesticide&Chemical Co., Ltd initially approved the registration of thiamethoxam technical product in China.

Thiamethoxam is a neonicotinoid insecticide developed by Novartis (now Syngenta) in 1991, its mechanism of action similar to that of imidacloprid, which is selectively inhibit the nervous system cholinesterase receptor in central nervous system, thereby blocking the insect central nervous systemnormal conduction, making the insects become paralyzed. Where it acts as a deterrent to insect feeding. It is active in the stomach of the insects, and also through direct contact with higher activity, better security, broader insecticidal spectrum and the role of fast, long duration. Thiamethoxam is effective against aphids, thrips, beetles, centipedes, millipedes, sawflies, leaf miners, stem borers and termites on rice, sugar beet, oilseed rape, potato, cotton, beans, fruit trees, peanuts, sunflowers, soybeans, tobacco and citrus without cross-resistance with imidacloprid, acetamiprid and nitenpyram. It can be used for stem and leaf processing, seed treatment, and can also be used for soil treatment.

Initial registration of indoxacarb technical product

Recently, Nantong Shizhuang Chemical Co., Ltd. initially approved registration of indoxacarb technical product by ICAMA.

Indoxacarb is an oxadiazine pesticide developed by DuPont that acts against lepidopteran larvae such as diamondback moth, vegetables caterpillar, Spodoptera litura, Mamestra brassicae, the cotton bollworm, tobacco budworm, leaf roller class, codling moths, leafhoppers, potato beetles on cabbage, beet army worm on the class of broccoli, kale, tomatoes, peppers, cucumbers, zucchini, eggplant, lettuce, apples, pears, peaches, apricots, cotton, potatoes, grapes and other crops. Its insecticidal activity occurs via blockage of the sodium channels in the insect nervous system and the mode of entry is via the stomach and contact routes. Indoxacarb is the active ingredient in a number of household insecticides, including cockroach baits, and can remain active after digestion.

Orthosulfamuron got temporary approval in China

Recently, Yancheng South Chemical Co., Ltd. approved the temporary registration of orthosulfamuron technical by ICAMA. The product is exclusively for export, not the domestic market.

Orthosulfamuron is a systemic herbicide belonging to the sulfamoylurea class of chemicals. The pesticidal mode of action (MOA) for orthosulfamuron is through inhibition of the plant enzyme acetolactate synthase (ALS), which is also known as acetohydroxyacid synthase. Inhibition of this enzyme blocks branch-chain amino acid biosynthesis of valine, leucine, and isoleucine involved in plant growth processes leading to death of the plant. The active ingredient can be absorbed via the leaves, root. The field efficacy trials show that it can control barnyard grass, sedge and broadleaf weeds in rice field.

Orthosulfamuron, which is mainly for rice and sugar cane, launched in the United States and Colombia in 2007, approved the registration in Italy and Bangladesh in 2008 and Brazil in 2011. Isagro is expected to promote in more rice-growing countries, especially India, Japan, China, Brazil and Vietnam. Isagro sales in Brazil through its joint venture ISEM with Chemtura, and cooperates with RiceCo to sale and market in US.

China approves folpet temporarily

Recently, Yingde Guangnong Chemical Co., Ltd. approved the temporary registration of 95% folpet technical by ICAMA. Folpet is a protective leaf fungicide. Its mode of action inhibits cell division of a broad spectrum of microorganisms. It is used to control cherry leaf spot, rose mildew, rose black spot, and apple scab. Used on berries, flowers, ornamentals, fruits and vegetables, and for seed- and plant- bed treatment. Also used as a fungicide in paints and plastics, and for treatment of internal and external structural surfaces of buildings. At present, MAI is the main folpet producer.

DuPont orthosulfamuron got temporary approval in China

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Orthosulfamuron is a nonsystemic selective systemic fungicide, inhibiting fungal respiration and has both preventative and curative properties, mainly control of yellow, brown and crown rusts, powdery mildew, sooty mould, mild blast and leaf blotch and tan spot on cereal crops with improved curative properties compared to azoxystrobin in certain crops.

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The rapid development of fungicide difenoconazole

According to CCPIA, in the first half of this year, output, sales and exports of domestic Difenoconazole reached 1065.29 tons, 657.99 tons and 739.41 tons, respectively.

Difenoconazole, a novel, high efficient and safe triazole fungicides, its global sales is about $ 200 million, among top of the triazole fungicides. Recently the price began to rise steadily. The domestic output and demand both maintain a rapid growth.

In recent years, the capacity expansion of difenoconazole has been accelerating. Since the registration of Syngenta in China as the precedent, the registration and production of difenoconazole is increasing in a leaps-rapid, recently. Up to now, total of 13 enterprises had gotten registration of difenoconazole technical. With the up-and-up of the situation in domestic market, a number of domestic enterprises plans to expand and construct new plant, such as Jiangsu Gengyun Chemical Co. Ltd., which moved to International Chemical Industrial Park in Zhenjiang New District, has promoted the capacity to 1000 t/a. At present, the capacity of difenoconazole has broken through 3500 t/a.

The demand for difenoconazole is in a rapid growth. In the past few years, due to its high price, difenoconazole is only used for cash crop, such as vegetables and fruits. It is expected to continue to rise in the coming years, as plant diseases grow more widespread and the economic benefit for farmers of planting vegetables and fruits becomes more noticeable.

Initial registration of mesotrione WDG approval

Recently, Anhui Zhongshan Chemical Co.,Ltd. approved initially registration of mesotrione WDG products by ICAMA, including 75% mesotrione WDG and 80% mesotrione atrazine WDG.

Mesotrione will be applied pre- and post-emergence through ground or aerial application equipment. Mesotrione has herbicidal activity against broadleaf weeds. It's efficacy is the result of the inhibition of the enzyme 4-hydroxyphenylpyruvate dioxygenase (HPPD) enzyme in target plants. The field experiments show that mesotrione SC can control annual broadleaf weeds and some grass weeds such as velvetleaf, amaranth, pigweed, smartweed, barnyard grass, crabgrass in the cornfield and show poor effect on Acalypha and grass weed.

s-metolachlor approval in China

Shangyu Nutrichem Chemical Co., Ltd. approved the registration of s-metolachlor TC by ICAMA, recently. s-metolachlor is a selective pre-emergence herbicide. It is used for grass and broadleaf weed control in corn, soybean, peanuts, sugarcane, sorghum, and cotton, rape, potato, onion, pepper and cabbage. It is also used in combination with other herbicides.

Application and development prospects of chloroacetyl chloride in the pesticide

Chloroacetyl chloride, is an important organic chlorine products, widely used in pesticides. Chloroacetyl chloride is an excellent acylating agent. Most of the manufacturers produce omethoate through aminolysis process with an overall yield of 40%~50%, and oil content of 70%. Bayer uses chloroacetyl chloride as an intermediate for the production of omethoate with an overall yield of 70%, and oil content of 90%. Synthesis of selective herbicide butachlor through chloroacetyl chloride yields 90% of product. Chloroacetyl chloride as an intermediate for organic synthesis has broad market prospects and good economic benefits.

1. Application of chloroacetyl chloride in the pesticide

Chloroacetyl chloride is an important organic intermediate. As the acylating agent in the synthetic pesticide, it has more advantages in product yield and quality than other acylation methods due to its high reactivity.

In pesticides, chloroacetyl chloride is mainly used for the synthesis of phosphorodithioate or thiophosphate insecticide/nematicide and chloroacetamide herbicides. Among them, herbicide products include alachlor, diethyl-thyl, dimethachlor, metazachlor, acetochlor, propachlor, xylachlor, anilofos and piperophos; organophosphorus insecticide mainly include over 20 varieties such as dimethoate, omethoate, prothoate, formothion, sophamide, mecarbam; fungicides varieties mainly include metalaxyl etc.. Chloroacetyl chloride can also be used to prepare the amino-acid ester, plant growth regulator 4-chloroacetamide.
In pesticide production, the chloroacetyl chloride is mainly used for the production of the herbicide alachlor and anilofos, with about consumption of 1,200 t/a.

However, domestic product is limited in application due to poor quality and high production costs. With the improvement of the techniques and increase in production, chloroacetyl chloride in the application of the pesticide industry in China gradually developed, especially in the insecticide dimethoate, ethomate, herbicide acetochlor, butachlor, alachlor, anilofos and acetanilide pyrimidinic fungicide. The o-methoxylation production of chloroacetic acid as raw materials through anionolysis process yield of 35% ~ 45% with oil content of 70%. Bayer prepares the product with chloroacetyl chloride as raw materials through butane process, the total yield is up to 70% with the product content of 99%.

It is expected that demand for chloroacetyl chloride in herbicides and insecticides industry will increase enormously. Herbicide use in China will reach 150,000 t/a (off 100%), which demand for herbicide with chloroacetyl chloride as the raw material will be over 50,000 tons. By 2015, demand for chloroacetyl chloride will increase to 30,000 t/a.

Among many down-stream pesticide products of chloroacetyl chloride, here only a few cases of major pesticide production and application introduced.

1) alachlor

Alachlor, which is discovered by Monsanto in 1960, is a selective pre-emergence herbicide, mainly used for control of annual weeds and some broadleaf weeds on corn, soybeans, peanuts, sugar cane, non-sandy soil of cotton, canola, potatoes and other crops. By now, alachlor developed into a large tonnage of herbicides used in upland field.

2) Acetochlor

Acetochlor is the pre-emergence herbicide with the characteristics of safety and high activity, can control annual broadleaf weeds and some perennial weeds for corn, cotton, soybeans, peanuts, sugar cane, non-sandy soil of cotton, canola, potatoes and other crops. By now, alachlor developed into a large tonnage of herbicides used in upland field.

3) The pretilachlor is a selective pre-emergence herbicide, developed by Syngenta(Ciba-Geigy), it belongs to cell division inhibitor, can control barnyardgrass, cyperus diffolium, rotala indica.

4) propachlor is a selective pre-emergence herbicide for control of annual grass weeds and some broadleaf weeds on rice, corn, peanuts, beans, rapeseed.

5) ethachlor is a pre-emergence herbicide, can kill the germination weeds with the effect lasting 15~20 days, is mainly used for control of annual monocotyledons and some dicotyledons weeds in rice, soybeans and other crops fields.

2. Chloroacetyl chloride production process

China stared to develop chloroacetyl chloride in 1970s. At present, China has built more than 40 sets of production plant, of which total production capacity reaches 24,000 t/a. The major domestic producers and their production capacity statistics are shown in Table 1.

<table>
<thead>
<tr>
<th>Company</th>
<th>Capacity</th>
</tr>
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<tbody>
<tr>
<td>Zibo Zhongci Hi-CH</td>
<td>3,000</td>
</tr>
<tr>
<td>Nanjing Daxin Chemical</td>
<td>1,500</td>
</tr>
<tr>
<td>Shandong Shindone Finechemical</td>
<td>1,000</td>
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<tr>
<td>Henan Puyang chloralkali</td>
<td>1,000</td>
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<tr>
<td>Shangdong Fangguan BISO</td>
<td>1,000</td>
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</tbody>
</table>

Among several chloroacetyl chloride production methods, the current domestic industrialization processes are: chloroacetic acid - chlorine synthesis process, chloroacetic acid - phosphorous tri-chloride synthetic process, acetic acid - chlorine synthesis process, ethene - chlorine synthesis process; foreign process of industrialization acetyl chloride - chlorine process, carbon monoxide - methylene chloride process, trichloroethylene hydration process and dichloroethylene oxidation process.

Chloroacetic acid - chlorine synthesis process is the domestic earliest and most mature production process route, most manufacturers still use the process method of production. This technology is relatively simple, while the disadvantage is the long production cycle, the low yield (only 80% ~ 95%). Production per ton needs to consume 0.95 ton of chloroacetic acid and 0.72 ton of chlorine. New process via acetic acid and chlorine, in the case of manganous chloride as a catalyst, is developed by Henan Chemical Research Institute. Through the new process, production per ton needs to consume 0.72 ton acetic acid and 2 tons of chlorine with high purity (over 98%), no waste discharge and stable quality.

Chloroacetyl chloride is an excellent acylating agent, and plays more important role in pesticides. At present, the consumption of chloroacetyl chloride in pesticide industry is about 15,000 t/a. By 2015, demand for chloroacetyl chloride in pesticide industry will reach about 12,500 t/a.

Application and development prospects of catechol in the pesticide

Catechol, also known as pyrocatechol or 1,2 - hydroquinone, is an important fine chemical raw materials which is widely used in pesticides. Catechol is a raw material of carbamate pesticide carbofuran, proprop and diethofencarb. Benfuranol is the intermediate of carbofuran. Its development and production was driven by market demand over supply in recent years. Propoxur, which is recommended by WHO as a insecticide for control of household pests and warehousing Pest, has good market prospects, and its development depends on the intermediate catechol.

Among several synthesis process of catechol, the method through hydroxylation of o-dichlorobenzene, o-chlorophenol or phenol are mainly used in the industry. However, the first two methods had been eliminated due to the poor product quality and environment issues. Catechol industry in China began in the 1970s, has made the breakthrough after long-term unremitting efforts.

Domestic scientific research institutions has successfully developed industrial production of catechol through hydroxylation of phenol. In recent years, domestic catechol industry has developed rapidly. Lianyungang Sanjili Chemical Industry Co., Ltd. has successfully established a production plant in cooperation with the Tianjin University, Tsinghua University, Dalian University of Technology, etc. Foreign total production capacity of catechol is about 28,000 t/a, all preparation is through the phenol hydroxylation method, including Rhone Pollenc with 19,000 t/a (6,000 t/a in US), Union-Industry Ltd, with 5,000 t/a and Brichima with 3,000 t/a. Over the years, China's annual production capacity has been hovering in the hundreds of tons, production can't meet market demand. During 1995-1999 annual import volume reach nearly over 2,000 t. It's estimated that domestic demand for catechol is about 15,000 t/a.

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CCPIA Organizer

CCPIA, established in 1982, is the leading industrial association in China agrochemical industry. Nearly 500 qualified Chinese manufactures & formulators are our members, who contribute 95% of the national agrochemical production in total. We are aiming at serving the industry by a series of activities to maintain the healthy growth of Chinese agrochemical industry with the support of related government sectors and our members.

Exhibitors

This year we arrange 500+ stalls for our selected exhibitors to make sure that our visitors can meet with top renowned producers. Most are the qualified manufactures with "Three Certificates", i.e., Pesticide Registration Certificate, Pesticide Production License & Product Standard Certificate.

Exhibitor Type:
- Pesticide Enterprises: Technical / formulation
- Additive Companies: Raw material, intermediate, adjuvant
- Equipment Suppliers: New facilities, packing and other equipments for research, producing, processing, transportation and application of pesticides.
- Related Service Suppliers: Service organizations, media, bookstore, etc

Visitors

Our visitors mainly are CEOs, international trade managers, R&D specialists in the agrochemical industry. Last year, we have 12,000 visitors worldwide attended AgroChemEx 2011.

Procurement Matchmaking Program

This program aims to help our buyers and exhibitors to find their ideal partners quickly. Please send your interested products to Ms Kitty Chen@kittychen@ccpia.org.cn. And we shall arrange a series of one-on-one meetings for you according to the actual situation during AgroChemEx 2012. This program is free but with limited availability.

High Level Conferences

- Decoding important policy updates from government authorities in pesticide industry
- Learning new methodologies and trends in latest R&D, formulations and adjuvants, etc
- Sharing successful experience of procurement and sourcing strategies in China from most-renowned companies and buyers

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For more information, please visit our website: www.agrochemex.org Contact: Kitty Chen +86-10-8488-5907 kittychen@ccpia.org.cn
www.agrochemex.net

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