

Fungicides China News

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Headline

The Chinese pyraclostrobin market was hot in the year 2016. Increasing enterprises broke into this business and made great achievements.

The Hubei Crop Protection Station predicted that, in the year 2017, demands for fungicides and herbicides would increase, while those for insecticides and acaricides may decrease slightly.

Despite the general depression in the pesticide market, several enterprises stood out as "dark horses" in 2016. It is expected that these enterprises will play leading roles in the Chinese pesticide business.

Jiangsu Pesticide Research Institute intended to increase its phenamacril production capacity from 150 t/a to 1,000 t/a, with total investment standing at USD1.73 million (RMB12.00 million).

In Jan. 2017, Shandong United Pesticide obtained official registration certificates for fluoride ether bacteria amide. This will be a great impetus for the company to expand shares in the market. Yet, it may also face intense market competition as well.

On 10 Jan., 2017, Rotam Agrochemical established a joint venture with GEOSAT to extend into the agricultural UAV business. Additionally, it also enriched its product mix by introducing upgraded version of existing products and special fertilisers, developed crop protection solutions and set up online business platform, in order to seek new sources of profits as well as improve market competitiveness.

Between Jan. and Oct. 2016, the export volume of captan TC from China increased, while the corresponding export price slid.

A total 13 pesticides were registered for the first time in China in the year 2016, including 5 fungicides, according to the ICAMA.

As of Dec. 2016, Nufarm had altogether 22 effective pesticide registration certificates in China, most of which were for pesticide formulations.

The NATESC predicted that pests and diseases may strike heavily in the year 2017, with a national total occurrence area of 346.67 million ha (5.20 billion mu). In the following article, CCM makes a detailed introduction to the forecast on disease occurrence.





Editor's Note

In late 2016, the Chinese pesticide market finally turned around, after a long depression, and this upturn continued on into early 2017. Particularly, the fungicide technical market kept thriving. Products like hexaconazole and tebuconazole stood out with continuously rising prices.

Despite the recovery, the year 2016 still witnessed a general depression in enterprises' performance. Against this, several small-sized but distinctive enterprises stood out as "dark horses" in 2016 and have gained increasing presence in the domestic market, including Beijing Mindleader, Huizhou Yinnong, Longwan Chemicals, Zhejiang Xinnong and Sichuan Taikang.

In Jan. 2017, the NATESC made a prediction for occurrence of pests and diseases for the year 2017, indicating that diseases may strike heavily. Pesticide producers can take the occurrence forecast as a reference for marketing over the coming period.

The USD/RMB exchange rate in this newsletter is USD1.00=RMB6.9498 on 3 Jan., 2017, sourced from the People's Bank of China. All the prices mentioned in this newsletter will include the VAT, unless otherwise specified.



Market Dynamics

Increasing Chinese enterprises break into pyraclostrobin market in 2016

Summary: The Chinese pyraclostrobin market was hot in the year 2016. Increasing enterprises broke into this business and made great achievements.

A craze for pyraclostrobin rose throughout the year 2016 in the Chinese fungicide market. High efficacy, low toxicity, broad-spectrum and environmentally friendly, pyraclostrobin has been positioned as a key product in many pesticide enterprises' marketing strategies.

BASF, the first player in the Chinese pyraclostrobin business, takes up the largest shares in the market. To date, the company has introduced 10 pyraclostrobin-containing products in the country, including:

- Cabrio® (pyraclostrobin 250 g/L EC)
- Bai Tai® (pyraclostrobin + metiram 60% WDG)
- Cabrio® Team (dimethomorph + pyraclostrobin 18.7% WDG)
- Merivon® (pyraclostrobin + flutolanil 42.4% SC)
- Pristine® (pyraclostrobin + boscalid 38% WDG)
- Opera® (pyraclostrobin + epoxiconazole 17% SC)
- Maccani® (dithianon + pyraclostrobin 16% WDG)
- Seltima® (pyraclostrobin 9% CS)
- Delit® (pyraclostrobin 18% FS)
- Xinzun® (pyraclostrobin + thiophanate-methyl 41% FS)

Of these, Cabrio® and Bai Tai® are the best sellers, whose sales volumes even head the whole Chinese pyraclostrobin market.

Quite a few domestic pesticide producers have also launched their pyraclostrobin formulations, such as Qingdao Hailir Pesticides & Chemicals Co., Ltd., Beijing Yoloo Biotechnology Co., Ltd. (Beijing Yoloo), Beijing Mindleader Agrosience Co., Ltd., Shenzhen Noposion Agrochemicals Co., Ltd. (Shenzhen Noposion) and Jiangxi HKLS Biotechnology Co., Ltd.

These companies made great achievements in the year 2016. "Their sales of pyraclostrobin formulations all reached or even exceeded USD4.32 million (RMB30.00 million)," trade sources disclosed to CCM. Of course, the BASF's figure was much higher.

Table 1: Leading pyraclostrobin formulations (by sales) in China, 2016

No.	Region	Producer	Product
1	Overseas	BASF	Bai Tai® (pyraclostrobin + metiram 60% WDG)
2			Cabrio® (pyraclostrobin 250 g/L EC)
3	Domestic	Qingdao Hailir Pesticides & Chemicals Co., Ltd.	"Jirun (极润)" (pyraclostrobin 50% WDG)
4		Beijing Yoloo Biotechnology Co., Ltd.	"Chuanqi (传奇)" (pyraclostrobin + thiophanate-methyl 30% SC)
5		Jiangxi HKLS Biotechnology Co., Ltd.	"Jucai (巨彩)" (pyraclostrobin + tebuconazole 45% WP)
6		Beijing Mindleader Agrosience Co., Ltd.	"Mingrunfeng (明润丰)" (pyraclostrobin + tebuconazole 30% SC)
7		* Guangdong Dongguan Ruidefeng Biotechnology Co., Ltd.	"Lvqi (绿琦)" (pyraclostrobin 30% EC)

Note: * A subsidiary of Shenzhen Noposion Agrochemicals Co., Ltd.

Source: CCM

In fact, increasing domestic pesticide enterprises are inclined to extend into the pyraclostrobin market. After BASF's patent on pyraclostrobin expired on 21 June, 2015 in China, number of registered pyraclostrobin TC and formulations has skyrocketed. As of 6 Jan., 2017, a total 190 certificates were issued, including 45 for pyraclostrobin TC, 52 for single formulations and 93 for mixtures. Types of the formulations covered SC (57), WDG (46), EC (19), WP (7), EW (6), ME (4), and FS (4). "These figures will further increase over the coming period," predicted an industry insider.

Yet, only 7 of the 45 enterprises with pyraclostrobin TC registration have been licensed to produce (as of 14 Nov., 2016), namely Shanghai Heben-Eastsun Medicaments Co., Ltd., Dezhou Luba Fine Chemical Co., Ltd., Shandong Kangqiao Biotechnology Co., Ltd., Zhejiang Boshida Crop Science Co., Ltd., Jiangsu Frey Agrochemicals Co., Ltd., Jiangsu Tuoqiu Agrochemicals Co., Ltd. and Sun Shine Chemical Co., Ltd., according to the Ministry of Industry and Information Technology of the People's Republic of China. However, few of these manufacturers were actually operating, affected by stringent environmental regulations.

According to CCM's research, Beijing Yoloo and Shenzhen Noposion, the top two pyraclostrobin formulation producers by sales in China (combined to account for 50%+ of the sales in the domestic market), mainly depend on pyraclostrobin TC imported from BASF. In other words, demand for pyraclostrobin TC only come from formulation producers that take up <50% of the sales. Despite this, supply of pyraclostrobin TC remained tight in 2016, and its price was boosted.

Although increasing domestic enterprises announced their plans to launch pyraclostrobin TC projects, only a few products are now available in the market. It is expected that such a shortage will be eased as pyraclostrobin TC producers optimise their production technology in the near future.

Table 2: Selected pyraclostrobin TC manufacturers in China, as of Jan. 2017

No.	Enterprise
1	Dezhou Luba Fine Chemid Co., Ltd.
2	Shijiazhuang Shentai Chemical Co., Ltd.
3	Hunan Haili Chemical Industry Co., Ltd.
4	Huai'an Guorui Chemical Co., Ltd.
5	Jiangsu Tuoqiu Agrochemicals Co., Ltd.
6	Jingbo Agrochemicals Technology Co., Ltd.
7	Limin Chemical Co., Ltd.
8	Rudong Zhongyi Chemical Co., Ltd.
9	Shandong Hailir Chemicals Co., Ltd.
10	Shandong Kangqiao Biotechnology Co., Ltd.
11	Taizhou Dapeng Pharmaceutical Industry Co., Ltd.
12	Zhejiang Boshida Crop Science Co., Ltd.

Note: Some of the above-mentioned producers have been in production already, while some are still constructing production units.

Source: CCM

Hubei: fungicide demand to increase in 2017

Summary: The Hubei Crop Protection Station predicted that, in the year 2017, demands for fungicides and herbicides would increase, while those for insecticides and acaricides may decrease slightly.

The Hubei Crop Protection Station (HCPS) made a prediction on the provincial pesticide demand for the year 2017. The total demand for pesticides is estimated to reach 47,200 tonnes (= around 12,800 tonnes of 100% pesticide technical), a slight decrease over 2016.

Increases are likely to be seen in figures of fungicides and herbicides, while those of insecticides and acaricides may decrease. Specifically,

- Insecticide: 22,000 tonnes
- Acaricide: 1,300 tonnes
- Fungicide: 7,800 tonnes
- Herbicide: 15,100 tonnes
- Plant growth regulator: 854 tonnes
- Rodenticide: 5.97 tonnes

Additionally, needs for agricultural machinery are predicted to grow steadily, especially agricultural unmanned aerial vehicles, backpack sprayers and self-propelled boom sprayers.

Zhang Kaixiong, head of the Pesticide & Machinery Department of the HCPS, disclosed reasons behind the changes in demand for pesticides in the year 2017.

Fungicide use may be boosted by:

1. Increased occurrence of diseases. For instance, rice sheath blight, false smut and blast have been found in expanding areas in recent years. Besides that, the occurrence of wheat head blight and rape sclerotinia has also become increasingly serious;
2. Expanding planting area of cash crops, such as pollution free vegetables. This means larger planting areas are stricken by



diseases. Particularly, continuous cropping is common in these areas, which will increase the number of fungi on fields and the occurrence of disease;

3. Improved awareness of disease prevention. As scientific farming methods spread, increasing farmers are inclined to take precautions against diseases, such as using fungicides in advanced.

Herbicides will be seen continuous growth in demand given:

1. Rising direct seeding areas of rice and large-scale farming;
2. Expanded weeding areas in both farmlands and non-farming lands;
3. Increased application of zero or reduced tillage methods;
4. Promotion of chemical weed control in mid- or late cropping period.

All these factors may contribute to the increasing use of sterilant herbicides, like glyphosate and glufosinate-ammonium, and stable consumption of selective stem and leaf treating herbicides.

Acaricides will be demanded less, because:

1. Abamectin is taking the place of common acaricides, given its outstanding efficacy and economical price;
2. Acarids on cotton have struck slightly in recent years, as the cotton planting areas have reduced and farmers have strengthened awareness of prevention.

Insecticide demand may go down a little, due to decreased occurrence of pests in Hubei. Currently, only small quantities of pests are on the fields, thanks to the wide application of high efficacy and low toxicity pesticides and low temperature in the winter of 2016.

Company Dynamics

'Dark horses' in Chinese pesticide markets in 2016

Summary: Despite the general depression in the pesticide market, several enterprises stood out as "dark horses" in 2016. It is expected that these enterprises will play leading roles in the Chinese pesticide business.

Despite a turnaround in Q4, the year 2016 witnessed a general depression in the Chinese pesticide market – low prices of agricultural produce upset farmers and, in turn, demand for pesticides; both exports and domestic sales decreased; many listed companies and foreign enterprises suffered reduced profits.

Against such a depression, several small-sized but distinctive enterprises stood out as "dark horses" in 2016 and have gained increasing presence in the domestic market.

Beijing Mindleader Agrosience Co., Ltd. (Beijing Mindleader): advanced techniques, quality products & complete services





Beijing Mindleader has grown rapidly ever since its founding in 2011. To date, its sales have exceeded USD24.46 million (RMB170.00 million) and even soared by around 60% YoY in the year 2016. In particular, its leading product "Mingrunfeng" (明润丰, tebuconazole + pyraclostrobin 30% SC) even recorded a sales of USD4.32 million+ (RMB30.00 million+) in that year.

In the coming period, the company plans to diversify its product portfolio by developing new chemical compounds, types of formulation (such as DF, OF and CJ) and pesticide application methods. That aside, Beijing Mindleader will also improve its crop protection services, given that demand for one-stop crop protection solutions grows as land transfer develops. As product sales further increase and services improve, the company will gradually transition to a specialised crop protection service supplier. Notably, it expects to achieve sales of USD71.94 million (RMB500.00 million) by 2019 and then to get listed on Main Board, a step to expand financial channels, acquire crop protection service companies and finally establish a large-scale crop protection service platform.

Huizhou Yinnong Technology Co., Ltd. (Huizhou Yinnong): streamlined and dedicated business structure

In 2012, Huizhou Yinnong suspended operation of its semi-automatic plants and built up three new plants equipped with seven DCS (Distributed Control System) automatic production lines for ME, SC and WDG. Meanwhile, it cut down number of registered pesticides and turned dedicated to six key products, which ensure product quality and prevent cross-pollution of pesticide raw materials.

In 2016, the company launched a new emamectin benzoate formulation and broke into in the markets of insecticides against thrips. This new product, together with another leading fungicide "Nongjingling" (农精灵, azoxystrobin + difenoconazole 30% SC), gained well recognition in Hainan mango planting areas. In fact, Huizhou Yinnong made great achievements in the year 2016 – generating total sales of USD14.39 million+ (RMB100.00 million+) from seven key products, entering the New Third Board (= National Equities Exchange and Quotations), and being listed on the 2016 China Top 50 Pesticide Formulation Enterprises by Sales.

To further extend into premium pesticide formulation market, Huizhou Yinnong built up a new R&D centre and established partnership with BASF in late 2016. In 2017, the company aims to realise sales of USD14.39 million+ (RMB100.00 million+) from individual product.

Zhejiang Longwan Chemicals Co., Ltd. (Longwan Chemicals): focusing on thiediazole copper formulations

Longwan Chemicals has been a well-known producer of fungicides, especially thiediazole copper formulations. In fact, the company has benefited a lot from the thiediazole copper market. In 2016, despite the depression in the overall pesticide market, demand for thiediazole copper remained strong – the domestic and overseas sales still reached 900 tonnes, with an annual growth rate of around 25%.

In the near future, Longwan Chemicals plans to increase efforts to innovate types and application of thiediazole copper formulations. "We are applying for application of thiediazole copper on peach bacterial shot hole and tomato bacterial wilt at present. In the coming period, we expect to expand the use of thiediazole copper against 20 more bacterial diseases and its application on some special crops," disclosed the company. According to the Institute for the Control of Agrochemicals, Ministry of Agriculture, thiediazole copper have so far been registered for prevention and control of tomato leaf spots, bok choy soft rot, cucumber angular leaf spot, orchid bacterial soft rot, rice bacterial leaf streak, rice bacterial blight, tobacco wild fire, tobacco





bacterial wilt, citrus canker, citrus bacterial scab, watermelon fusarium wilt and cotton root rots (seedling period).

Zhejiang Xinnong Chemical Co., Ltd. (Zhejiang Xinnong): specialised producer of Zn-thiodiazole

Zhejiang Xinnong got listed on the New Third Board (= National Equities Exchange and Quotations, NEEQ) in 2015 and made great achievements in the year 2016:

- In May, the company obtained registration certificate of Zn-thiodiazole 20% SC on rice in Thailand, the first Chinese innovative pesticide registered in the country
- In Nov., the company announced that it was receiving pre-listing tutoring by EverBright Securities Co., Ltd.
- In Dec., the company was granted a "Gold Invention Award" for its overseas registration of Zn-thiodiazole at the 18th Ceremony for the WIPO-SIPO Award for Chinese Outstanding Patented Invention & Industrial Design

Sichuan Taikang Biotechnology Co., Ltd. (Sichuan Taikang): dedicated to biopesticides

Founded in 2000, Sichuan Taikang has been focusing on innovation and production of biopesticides. As of 2016, the company applied for altogether 28 patents (including 19 for invention), of which 12 were issued already.

Its leading products include:

- Chitosan 0.5% AS ("Taikang", 太抗®): the first registered biopesticides with dual efficacy of fungicide and plant growth regulator, and meanwhile the first pesticide approved to be used as plant resistance inducer
- *Trichoderma harzianum* 100 million DFU/g WDG ("Muzimei", 木子美™): targeted at gray mould, sclerotinose and pythium disease
- *Bacillus subtilis* 100 million CFU/g CG ("Kuyachun", 枯芽春™): the first officially registered biopesticide CG, targeted at soil-borne diseases like root rots and fusarium wilt

In Oct. 2016, Chengdu Tepu Bio-technology Co., Ltd., Sichuan Taikang's subsidiary, entered the NEEQ – the only listed pesticide enterprise dedicated to biopesticides in China.

Jiangsu Pesticide Research Institute to expand phenamacril production

Summary: Jiangsu Pesticide Research Institute intended to increase its phenamacril production capacity from 150 t/a to 1,000 t/a, with total investment standing at USD1.73 million (RMB12.00 million).

On 20 Dec., 2016, Jiangsu Pesticide Research Institute Co., Ltd. (Jiangsu Pesticide Research Institute) made the first announcement on the environmental impact assessment results of its phenamacril production expansion project. The company planned to invest a total of USD1.73 million (RMB12.00 million) to make technological upgrades and increase its phenamacril production capacity from 150 t/a to 1,000 t/a, together with 150 t/a phosphoric acid (as by-product of phenamacril) and supporting facilities. This project would be constructed in the company's existing plant in Nanjing Chemical Industry Park, Jiangsu Province.

"This move will help Jiangsu Pesticide Research Institute expand its shares in the market. In fact, demand for phenamacril has kept growing given its outstanding efficacy," an industry insider commented to CCM.

Phenamacril, a member of the cyanoacrylate family, is independently developed by Jiangsu Pesticide Research Institute. The



company has so far obtained six patents for the fungicide, including one for invention and five for application. Unique in chemical structure, phenamacril is especially targeted at wheat head blight and rice bakanae disease. Such a specialty distinguishes it from broad-spectrum products and makes it stand out in the market.

Frequent and serious outbreaks of wheat head blight keep boosting demand for phenamacril, particularly when fusarium (the cause of wheat head blight) has grown increasing resistance to carbendazim after years of unchanged and continuous use. Compared with the various other targeted fungicides, like benzimidazole fungicides, prochloraz and triazoles, phenamacril shows much more outstanding effectiveness. Given this, phenamacril is recommended by many regional agricultural departments and included on the government procurement lists.

"Phenamacril made great achievements in prevention & control of wheat head blight in 2016," disclosed Jiangsu Pesticide Research Institute, at the company's product development seminar held in Dec. 2016.

"This year saw heavy occurrence of wheat head blight, attracting much attention from the crop protection departments in wheat planting regions. Among all the new fungicides against wheat head blight, our Jinghu® (phenamacril 25% SC) and Jingxing® (phenamacril + tebuconazole 48% SC) stand out. They show excellent efficacy against the disease and significantly reduce the content of fusarium (the cause of wheat head blight), boosting the yields and farmers' incomes," introduced Marketing Manager Liu Chunqi.

Besides wheat head blight, phenamacril has also played an important role in preventing and controlling rice bakanae disease. Currently, Jiangsu Pesticide Research Institute is exploring potential application on other crops, such as cotton, banana and watermelon (all for fusarium wilt), according to field test statistics from the Institute for the Control of Agrochemicals, Ministry of Agriculture.

Table 3: Jiangsu Pesticide Research Institute's registrations of phenamacril in China, as of late Dec. 2016

No.	Registration No.	Active ingredient	Specification	Expiry date	Target
1	PD20121663	Phenamacril	95% TC	2017/11/5	/
2	PD20141746	Phenamacril + tebuconazole	48% SC	2019/7/2	Wheat head blight
3	PD20121670	Phenamacril	25% SC	2017/11/5	Wheat head blight and rice bakanae disease

Source: Jiangsu Pesticide Research Institute Co., Ltd.

Apart from its plan to expand phenamacril TC production, Jiangsu Pesticide Research Institute has also upgraded its production techniques for phenamacril formulations.

"In 2016, we increased our investments in optimising production techniques, especially the ones for Jinghu® and Jingxing®. These two products are now applicable in agriaviation machinery. For this, we expect to further expand our sales in the market of wheat head blight prevention & control," disclosed President Cao Yang.

Shandong United Pesticide obtains official registration of fluoride ether bacteria amide

Summary: In Jan. 2017, Shandong United Pesticide obtained official registration certificates for fluoride ether bacteria amide. This will be a great impetus for the company to expand shares in the market. Yet, it may also face intense market competition as well.

In early Jan. 2017, Shandong United Pesticide Industry Co., Ltd. (Shandong United Pesticide) obtained official registration



certificates for its independently developed fluoride ether bacteria amide 98% TC, fluoride ether bacteria amide 50% WDG and fluoride ether bacteria amide + hexaconazole 40% SC, according to the Ministry of Agriculture of the People's Republic of China (MOA).

Fluoride ether bacteria amide, jointly developed by Shandong United Pesticide and Shandong Agricultural University, was the first Chinese SDHI (succinate dehydrogenase inhibitor) fungicide. Prior to the official registrations, on 30 July, 2015 the company obtained temporary certificates for the three products. In the end of Nov. of the year, the two formulations were launched under the trade names of KanuozTM (fluoride ether bacteria amide 50% WDG, targeted at cucumber downy mildew) and KatalaTM (fluoride ether bacteria amide + hexaconazole 40% SC, targeted at rice sheath blight)

In China, registration certificate is a must for any pesticide to be launched into the market, as prescribed by the *Regulations on the Control of Agricultural Chemicals* and its supporting policies. Specifically, pesticide registrations are divided into the following two types:

- **Official:** five-year validity and allowed to be renewed
- **Temporary:** one-year validity; allowed to be renewed, but cumulative effective period should be within three years (if not, pesticide must be officially registered)

In general, pesticides licensed temporary certificates are allowed to be sold. For products that win market recognition with stable and outstanding quality, producers may then apply for official registrations.

Yet, such a transfer is not easy for most independently developed pesticides in the country. "Commercialisation and promotion of innovative pesticides still needs to be strengthened, compared with overseas markets," introduced Song Baoan, academician of the Chinese Academy of Engineering and vice principal of Guizhou University, "Most of the existing innovative pesticides only take up small shares in the market at present. Some even failed to be registered officially after their temporary certificates expired."

Certainly, it will be favourable for Shandong United Pesticide to further expand its shares in the fluoride ether bacteria amide market after obtaining the official registration certificates. Yet, it also faces fierce competition as well.

So far, a craze for SDHI fungicides has risen throughout the domestic and overseas markets. International agrochemical giants, like Syngenta, Bayer CropScience and BASF, have introduced quite a few SDHI fungicides into the Chinese market in the past few years.

Domestic producers also turned their eye to this hot market, but have yet to develop more innovative products. Besides Shandong United Pesticide, only Central China Normal University created a new SDHI fungicide, fubenmixian'an (, coded Y13149 in lab experiment), which was delegated to Beijing YOLOO Bio-Technology Co., Ltd. for the purpose of commercialisation and are now under the process of registration. Other enterprises are inclined to develop single formulations or mixtures of off-patented SDHI fungicides, like thifluzamide and boscalid.

In the coming period, as international agrochemical giants launch new SDHI fungicides, the market competition may get intensified. "SDHI fungicides are not something new in the global pesticide market. In fact, overseas agrochemical giants have developed series of outstanding products. Strengthen R&D capacity and create our own products. That is the solution to the fierce competition among homogenized generic pesticides." an industry insider commented to CCM.





In this context, fluoride ether bacteria amide, as the first SDHI fungicide developed by domestic enterprise, is expected to see promising market prospects.

Rotam Agrochemical seeks new sources of profits

Summary: On 10 Jan., 2017, Rotam Agrochemical established a joint venture with GEOSAT to extend into the agricultural UAV business. Additionally, it also enriched its product mix by introducing upgraded version of existing products and special fertilisers, developed crop protection solutions and set up online business platform, in order to seek new sources of profits as well as improve market competitiveness.

On 10 Jan., 2017, Jiangsu Rotam Agrochemical Co., Ltd. (Rotam Agrochemical) announced the start-up of Rotrasat Technology Co., Ltd. (Rotrasat), a joint venture established with GEOSAT Aerospace & Technology Inc. (GEOSAT) for agricultural unmanned aerial vehicle (UAV) business in Kunshan City, Jiangsu Province.

Rotrasat, a new but competitive player in the business, combines Rotam Agrochemical's R&D capacity of pesticide formulations and extensive sales network with GEOSAT's professional image processing and "Big Data" analysis ability in UAV manufacturing. Prior to Rotrasat, several pesticide formulation producers have already marched into this industry, such as Guangxi Tianyuan Biochemistry Co., Ltd., Jiangsu Kwin Group Co., Ltd., Zhejiang Wynca Chemical Group Co., Ltd., Hebei Veyong Bio-Chemical Co., Ltd., Qingdao Hailir Pesticides & Chemicals Co., Ltd. and Jiangxi Zhengbang Biochemical Co., Ltd.

"Rotrasat will be an important extension of Rotam Agrochemical's crop protection solutions. We expect that agricultural UAV services will help expand our market shares and boost our profits," disclosed Luo Changgeng, president of Rotam Global AgroSciences Limited.

Rotrasat is expected to help progress Rotam Agrochemical's transformation to service-oriented business. In the coming period, the company plans to set up crop protection service teams and carry out UAV operation training courses. That aside, it will also establish service stations nationwide based on Rotam Agrochemical's existing sales network, aiming to provide farmers with quick and responsive supports.

Besides its extension into agricultural UAV business, Rotam Agrochemical also diversified its product portfolio in order to seek new sources of profits and improve market competitiveness. On the same day of the establishment of Rotrasat (10 Jan., 2017), the company launched several upgraded products and, in particular, four innovative fertilisers, including "Jingjiu" (劲久, a controlled-release fertiliser), "Gaililong" (盖力龙, a calcium supplementing bio-organic fertiliser), "Tianshuai" (甜帅, a microbial formulation) and "Huodilong" (活地龙, a microbial organic fertiliser).

In fact, Rotam Agrochemical has taken a series of actions to boost financial performance in the past few years. For instance, it not only offers quality and economical pesticide formulations, but also provides farmers with crop protection solutions. Additionally, the company is one of the earliest online pesticide suppliers in China. In 2014, it built up its own online store (store.rotam.com), a membership-based E-commerce platform targeted at large-scale farms, agricultural cooperatives, family farms and so on.

Rotam Agrochemical is a Sino-foreign funded enterprise founded in Dec. 1995 and has grown into a leading producer of pesticide formulations in the Chinese market. According to its official website (www.rotam.com), the company also distributes products of

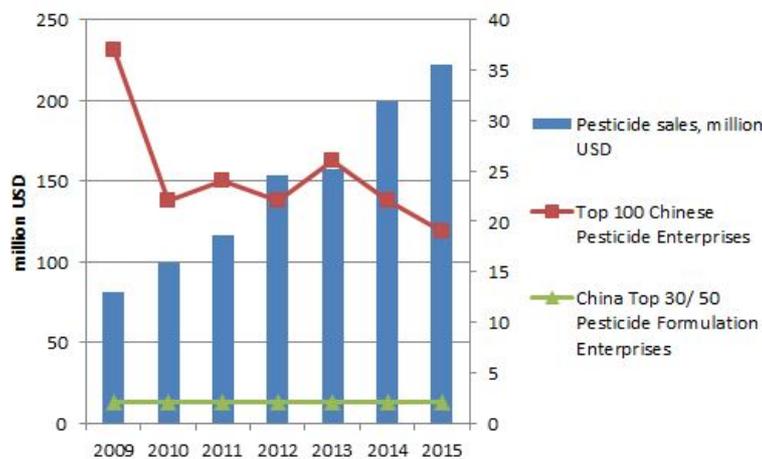


quite a few foreign agrochemical enterprises, such as Nippon Soda Co., Ltd., Nihon Nohyaku Co., Ltd., BASF, Dow AgroSciences LLC, Eisai Food & Chemical Co., Ltd., Industrias Químicas del Vallés, S.A., Total S.A. and Makhteshim Agan Industries Ltd.

Increases have been seen in Rotam Agrochemical's pesticide sales between 2009 and 2016. According to the China Crop Protection Industry Association, the company kept ranking No.2 in the 2009-2015 lists of China Top 30 / 50 Pesticide Formulation Enterprises by Sales (just following Shenzhen Noposion Agrochemicals Co., Ltd.) and correspondingly, stood among the top 30 of the Top 100 Chinese Pesticide Enterprises (by sales).

With a series of business strategies, Rotam Agrochemical is expected to see increasing profitability and realise further development over the coming period.

Figure 1: Rotam Agrochemical's pesticide sales & related rankings in Chinese pesticide industry, 2009-2015



Source: China Crop Protection Industry Association

Import & Export

China's export volume of captan TC increases in Jan.-Oct. 2016

Summary: Between Jan. and Oct. 2016, the export volume of captan TC from China increased, while the corresponding export price slid.

According to China Customs and CCM, a total of 645.46 tonnes of captan TC were exported from China in Jan.-Oct. 2016, up 37.49% YoY. Conversely, the corresponding export price fell by 7.60% YoY to USD4.73/kg.

Yet, the decreased price attracted purchasers to buy or even stockpile, boosting the export value – the figure during this period reached USD3.05 million, by 27.04% YoY.

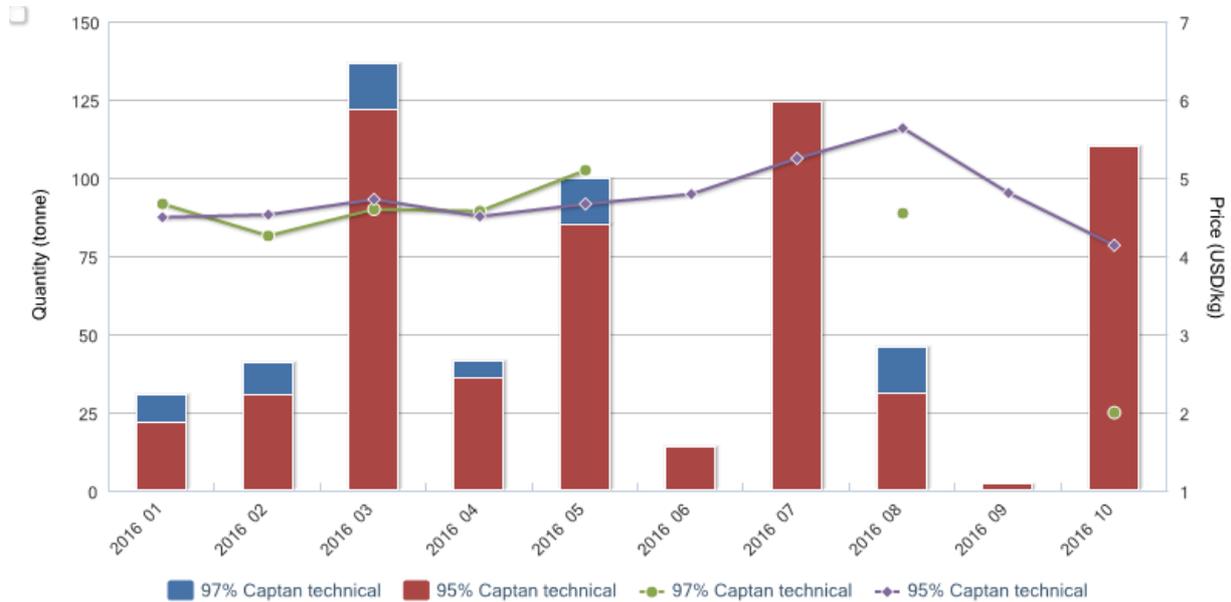
- Exporter (by manufacturer)

The top two captan TC exporters by volume during the ten months were Yingde Greatchem Chemicals Co., Ltd. and Hebei Guanlong Agrochemical Co., Ltd., 83.26% and 10.70% of the national total respectively.

- Export destination

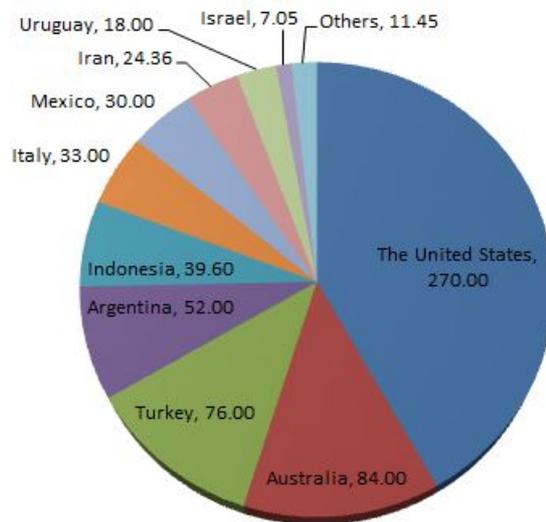
In Jan.-Oct. 2016, China exported captan TC to altogether 14 countries / regions. The top three export destinations by volume included the US, Australia and Turkey, 41.83%, 13.01% and 11.77% of the national total respectively.

Figure 2: China's exports of captan TC (95% and 97%), Jan.-Oct. 2016



Source: China Customs & CCM

Figure 3: Top 10 export destinations of captan TC from China (by volume), Jan.-Oct. 2016



Source: China Customs & CCM

Registration

Five fungicides registered for the first time in China in 2016

Summary: A total 13 pesticides were registered for the first time in China in the year 2016, including 5 fungicides, according to the ICAMA.

In 2016, altogether 13 pesticides were registered for the first time in China, including five fungicides, four herbicides, three

insecticides and one plant growth regulator, according to the Control of Agrochemicals, Ministry of Agriculture (ICAMA).

Specific information about the five new fungicides was as follows:

- *Bacillus methylotrophicus* 9912 (BAC-9912)

BAC-9912 was first registered by North China Pharmaceutical Group Aino Co., Ltd. on 26 Jan., 2016. The company obtained two certificates for the fungicide:

- BAC-9912 4 billion spore/g TK (Registration No.: LS20160012): micro toxicity
- BAC-9912 3 billion spore/g WP (Registration No.: LS20160011): micro toxicity; targeted at cucumber gray mould, spraying within a recommended use amount of 937.5-1,500 g/ha (based on formulation)

- Amisulbrom

On 16 March, Nissan Chemical Industries, Ltd. obtained its first registration certificates for amisulbrom in China:

- Amisulbrom 97.5% TC (Registration No.: LS20160084): low toxicity
- Amisulbrom 18% SC (Registration No.: LS20160085): micro toxicity; targeted at cucumber downy mildew (spraying within a recommended use amount of 60-80 g/ha, based on active ingredient [AI]) and potato late blight (spraying within a recommended use amount of 40-80 g/ha, based on AI)

Later on 21 June, the company registered amisulbrom 50% WDG (Registration No.: LS20160217), targeted at rice root rots during seedling period and tobacco black shank.

Amisulbrom is a contact fungicide with strong fungicidal activity against blights and downy mildew, especially the isolated spores. It mainly works as a preventive fungicide by inhibiting respiration of fungi and germination of spores.

- Fluoxastrobin

In June, Bayer CropScience obtained a temporary registration certificate for fluoxastrobin 94% TC (Registration No.: LS20160205), low toxicity. Meanwhile, Arysta LifeScience Corporation registered fluoxastrobin + chlorothalonil 51% SC (Registration No.: LS20160222), targeted at tomato late blight and cucumber downy mildew (spraying within a recommended use amount of 990-1,287 g/ha, based on AI).

Later on 18 Sept. the two companies obtained official certificates for their corresponding products (Registration No.: PD20161248 [TC]; PD20161247 [SC]).

- *Coniothyrium minitans* CGMCC8325

On 18 Sept., Wuxi Jiannong Bio-technology Co., Ltd. was issued a registration certificate (Registration No.: PD20161253) for its *Coniothyrium minitans* CGMCC8325 200 million spore/g WP. This low toxic formulation is targeted at rape sclerotinia (recommended use amount: 6.67-10 g/ha).

- Terpenol



The fungicide was first registered by Stockton (Israel) Ltd. on 16 Dec.:

- Terpineol 40.2% TK (Registration No.: LS20160418): low toxicity
- Terpineol 9% EC (Registration No.: LS20160413): low toxicity; targeted at tomato early blight and strawberry powdery mildew (spraying within a recommended AI amount of 90-135 g/ha)

In fact, quite a few innovative fungicides have been registered in China over the past few years. Fungicides first registered in China between 2012-2015 included:

- 2015: B2-a, fluoride ether bacteria amide, fenjuntong, β -sitosterol, coniothyrium minitans, oxathiapiprolin, metrafenone and penflufen
- 2014: *bacillus firmus*, *bacillus marinus*, sedaxane and Isopyrazam
- 2013: *coniothyrium minitans*, dodine, fenpropidine, fluxapyroxad, meptyldinocap, *sphaerotheca amyloliquefaciens* and methiadinil
- 2012: tricyclopyricarb, picoxystrobin and initium

Nufarm's valid pesticide registration in China as of Dec. 2016

Summary: As of Dec. 2016, Nufarm had altogether 22 effective pesticide registration certificates in China, most of which were for pesticide formulations.

Nufarm Limited (Nufarm), a leading overseas pesticide supplier to China, had a total of 22 valid registration certificates in the country as of late Dec. 2016, of which 21 were official ones and 1 temporary, according to the Institute for the Control of Agrochemicals, Ministry of Agriculture.

- By category

The company's registrations covered four kinds of pesticides:

- Herbicide: 8
- Fungicide: 7
- Insecticide: 4
- Plant growth regulator: 3

Of these, 19 were for pesticide formulations (including 2 mixtures), while only three were for pesticide technical, including MCPA-thioethyl 96% TC, glyphosate 95% TC and gibberellic acid 90% TC.

- By toxicity

Most of Nufarm's registered products were low toxic. Specifically,

- Low toxicity: 18
- Micro toxicity: 2
- Medium toxicity: 2



- By type of formulation

Nufarm registered altogether 10 types of formulation, the top three (by number of registered products) of which were SC (5), SP (3) and EC (3).

- By registration time

The majority of the company's pesticides were registered before / in 2009, 1 between 2010 and 2013, 3 in 2014, 1 in 2015 and 3 in 2016.

Table 4: Nufarm's valid registrations of herbicides in China, as of late Dec. 2016

No.	Registration No.	Active ingredient	Specification	Toxicity	Expiry date
1	PD20120645	MCPA-thioethyl	750 g/L AS	Low	2022.04.18
2	PD20160981	Glyphosate + triclopyr	70% SP	Low	2021.08.30
3	PD20160614	Florasulam	50 g/L SC	Micro	2021.04.26
4	PD20098480	MCPA-sodium	56% SP	Low	2019.12.24
5	PD20091168	Glyphosate-isopropylammonium	41% AS	Low	2019.01.22
6	PD20140137	Glyphosate-isopropylammonium + MCPAisopropylamine	47.50% SL	Low	2019.01.20
7	PD20085459	MCPA	96% TC	Low	2018.12.24
8	PD20081080	Glyphosate	95% TC	Low	2018.08.18

Source: Institute for the Control of Agrochemicals, Ministry of Agriculture

Table 5: Nufarm's valid registrations of fungicides in China, as of late Dec. 2016

No.	Registration No.	Active ingredient	Specification	Toxicity	Expiry date
1	PD321-2000	Copper hydroxide	77% WP	Low	2020.03.10
2	PD20142503	Fluoxastrobin	250 g/L SC	Low	2019.11.21
3	PD20142177	Epoxiconazole	125 g/L SC	Low	2019.09.18
4	PD268-99	Copper sulfate basic	27.12% SC	Low	2019.02.10
5	PD20090735	Copper hydroxide	57.60% WDG	Low	2019.01.19
6	PD20100327	Copper hydroxide	37.50% SC	Low	2019.01.11
7	PD20084775	Isoprothiolane	40% EC	Low	2018.12.22

Source: Institute for the Control of Agrochemicals, Ministry of Agriculture

Table 6: Nufarm's valid registrations of insecticides in China, as of late Dec. 2016

No.	Registration No.	Active ingredient	Specification	Toxicity	Expiry date
1	PD20151487	Imidacloprid	600 g/L FS	Medium	2020.07.31
2	PD20097193	Chlorpyrifos	480 g/L EC	Medium	2019.10.16
3	PD20090894	Buprofezin	25% WP	Low	2019.01.19
4	LS20160296	Imidacloprid	5% GR	Micro	2017.09.13

Source: Institute for the Control of Agrochemicals, Ministry of Agriculture

Table 7: Nufarm's valid registrations of plant growth regulators in China, as of late Dec. 2016

No.	Registration No.	Active ingredient	Specification	Toxicity	Expiry date
1	PD20095389	Gibberellic acid	20% SP	Low	2019.04.27
2	PD20085757	Gibberellic acid	90% TC	Low	2018.12.29
3	PD221-97	Butralin	360g/L EC	Low	2017.09.29

Source: Institute for the Control of Agrochemicals, Ministry of Agriculture

Table 8: Nufarm's valid pesticide registrations in China (by type of formulation), as of late Dec. 2016

No.	Type of formulation	Number of registered pesticides
1	SC	5
2	SP	3
3	EC	3
4	TC	3
5	WP	2
6	AS	2
7	GR	1
8	SL	1
9	WDG	1
10	FS	1
Total		22

Source: Institute for the Control of Agrochemicals, Ministry of Agriculture

Dieases

Prediction of disease occurrence for 2017 in China

Summary: The NATESC predicted that pests and diseases may strike heavily in the year 2017, with a national total occurrence area of 346.67 million ha (5.20 billion mu). In the following article, CCM makes a detailed introduction to the forecast on disease occurrence.

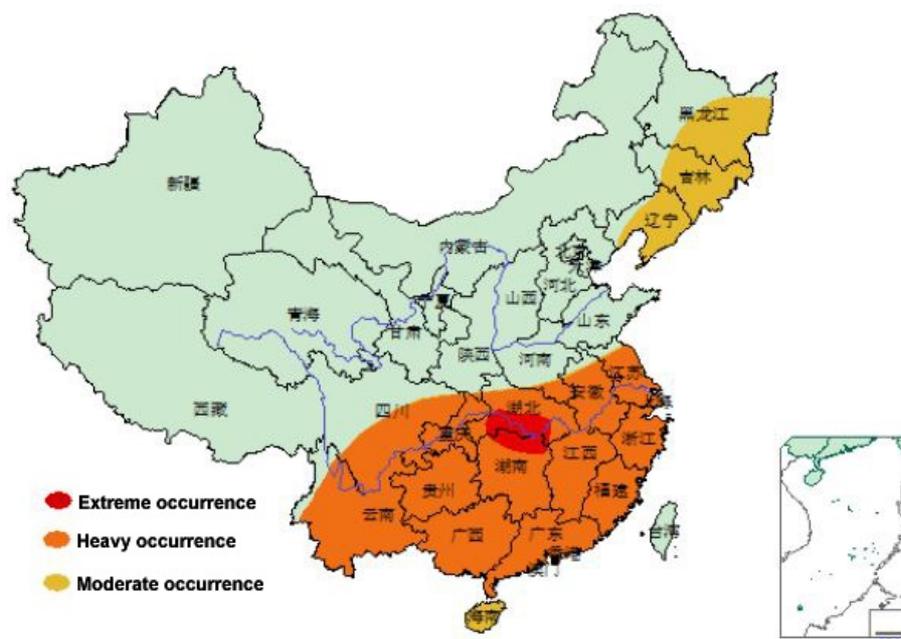
In Dec. 2016, the National Agro-Tech Extension and Service Centre (NATESC) held a conference for prediction of pest & disease occurrence for 2017, which can provide pesticide producers with a reference for marketing over the coming period. Personnel from provincial crop protection stations and experts predicted that pests and diseases may strike heavily in the year 2017, with a national total occurrence area of 346.67 million ha (5.20 billion mu). In the following article, CCM makes a detailed introduction to the forecast on disease occurrence.

- Rice sheath blight

Continual occurrence of rice sheath blight has been seen in recent years, as a result of which quantities of fungi have accumulated in the fields. Besides, the relatively warm weather and stable rainfall in the winter of 2016 was favourable for the survival of fungi. It is predicted that in the spring of 2017, temperature will remain relatively high and rainfall may reduce compared with the past years. That aside, most of the rice grown in China are susceptible to the disease.

In this context, rice sheath blight is expected to strike heavily in southern planting areas (with extreme occurrence in some parts) and moderately in northern regions. Total occurrence area is estimated to reach 17.67 million ha (265.00 million mu).

Picture 1: Prediction of rice sheath blight occurrence for 2017



Source: National Agro-Tech Extension and Service Centre

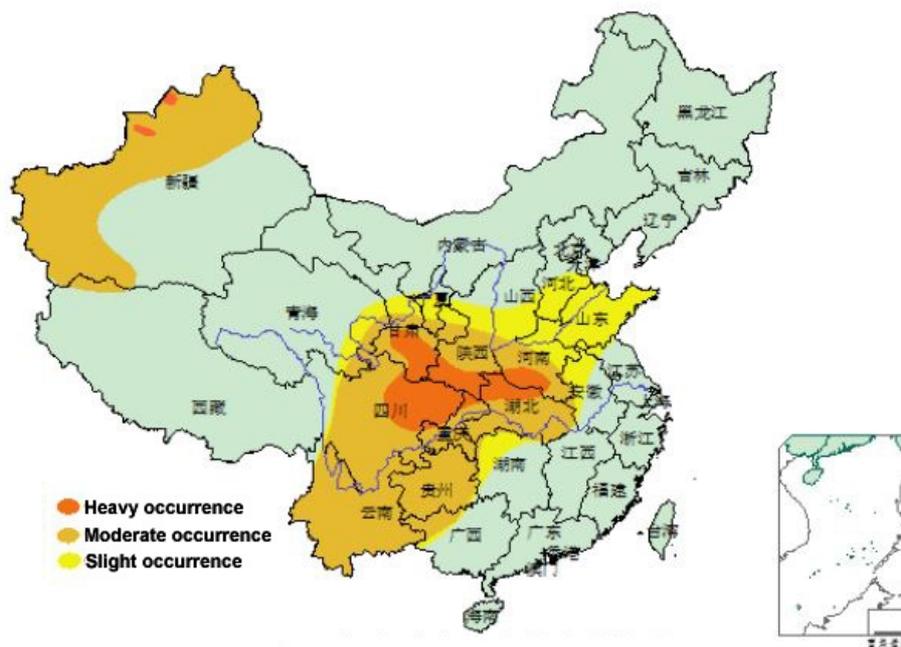
- Wheat yellow rust

Wheat yellow rust is predicted to strike moderately on the whole, with a total occurrence area of 2.00 million ha (30.00 million mu).

Specifically,

- **Heavy occurrence:** late-maturing wheat planting areas in mountains in southern and central Gansu Province, planting areas long rivers in Sichuan Province, as well as Ili River Valley and parts of Tacheng Basin in Xinjiang Uygur Autonomous Region
- **Moderate occurrence:** Jiangnan Plain, southwestern and western Shaanxi Province, southern Henan Province, southern Ningxia Hui Autonomous Region, eastern Qinghai Province, and other wheat planting areas in Southwest China, southern and central Gansu and Xnjiang (apart from the above-mentioned regions)
- **Slight occurrence:** central and northern Henan Province, southern and eastern Shandong Province, southern Shanxi and Hebei provinces, as well as other wheat planting areas in Shaanxi

Picture 2: Prediction of wheat yellow rust occurrence for 2017



Source: National Agro-Tech Extension and Service Centre

- Climatic diseases

Wheat head blight, rice blast, corn northern leaf blight and potato late blight are the most serious climatic diseases in China.

Currently, promoted crop varieties are susceptible or show weak resistance to these diseases – the majority of wheat grown in areas along the middle and lower reaches of Changjiang River, Changjiang-Huaihe region, Huang-Huai region and North China, 50%-60% of rice planted in Southwest and Northeast China, and 70%+ of potato in main planting regions. Meanwhile, disease-resistant varieties show weakened resistance, since continuous planting accelerates evolution of fungi, not to mention the cross-regional planting of wheat and rice. That aside, frequent fertilising and watering in high-yielding areas often boost the quantity of fungi, favourable for the occurrence of diseases.

In general, rice is vulnerable to climatic diseases in tillering and earing period, wheat in earing and flowering period, corn between



jointing and earing period, and potato in early flowering period, during which continual rainy or foggy days are common to see. High humidity, couple with favourable temperature, often leads to serious occurrence of climatic diseases.

According to the NATESC, the occurrence prediction for the four main climatic diseases in 2017 is as follows:

- Wheat head blight

In the spring of 2017, temperature in most wheat planting is estimated to come near to or a bit higher than the past years. Rainfall may reduce in regions along the middle and lower reaches of Changjiang River and Huang-Huai region. Yet, there is a high possibility of continual rainy or smoggy weather between wheat earing and flowering period in these regions. Provinces that suffer frequent occurrence of this disease may even see weakened prevention effect and exacerbated occurrence, as fungi develop increased resistance to common fungicides.

Given these factors, wheat head blight is expected to strike heavily on the whole in the year 2017, with a total occurrence area of 667 million ha (100.00 million mu). Specifically,

- **Extreme occurrence:** planting areas along Huaihe River in Anhui and Jiangsu provinces, Changjiang-Huaihe region, northern Zhejiang Province, coastal planting areas in Shanghai
- **Heavy occurrence:** Huang-Huai region and parts of planting areas along the middle and lower reaches of Changjiang River
- **Moderate occurrence:** southern part of North China, parts of planting areas in Southwest and Northwest China

- Rice blast

- Occurrence: moderate on the whole, with possible heavy occurrence in Southwest China, south of Changjiang River, along the middle and lower reaches of Changjiang River, and Northeast China
- Occurrence area: 4.67 million ha (70.00 million mu)

- Corn northern leaf blight

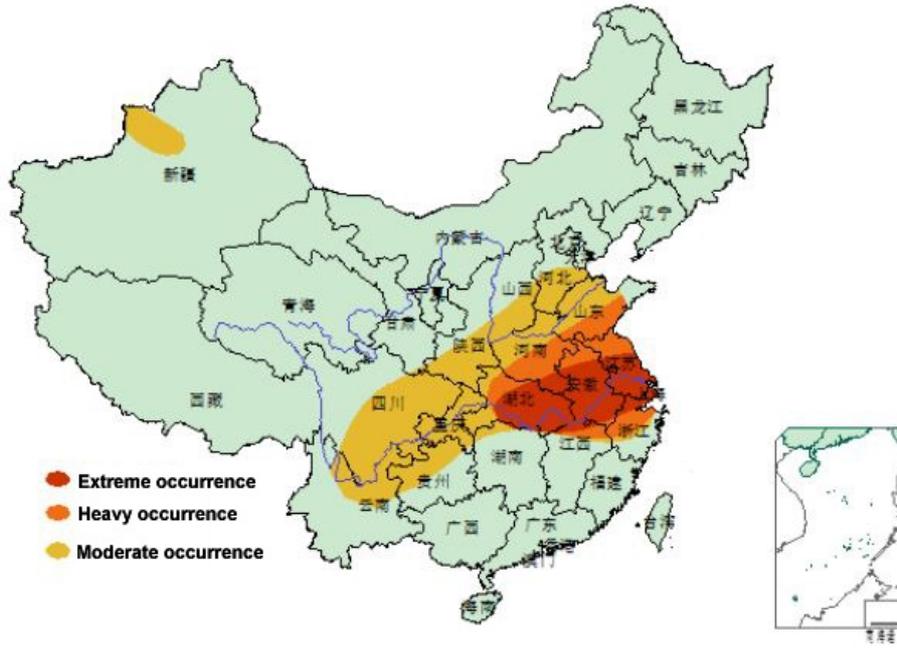
- Occurrence: moderate in Northeast China, North China and most parts of Southwest China, but heavy in parts of Northeast China
- Occurrence area: 4.67 million ha (70.00 million mu)

- Potato late blight

- Occurrence: moderate on the whole, with possible heavy occurrence in eastern part of Southwest China, central & southern Gansu, southern Shaanxi, northeast Inner Mongolia Autonomous Region, northern Shanxi, central & western Heilongjiang Province, as well as western parts of Hubei and Hunan provinces
- Occurrence area: 2.00 million ha (30.00 million mu)

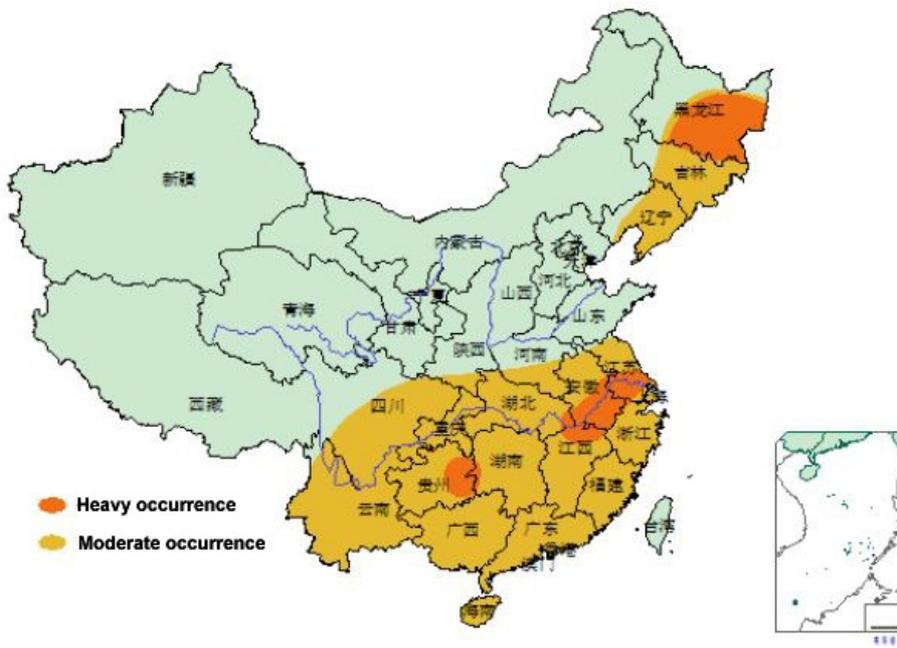


Picture 3: Prediction of wheat head blight occurrence for 2017



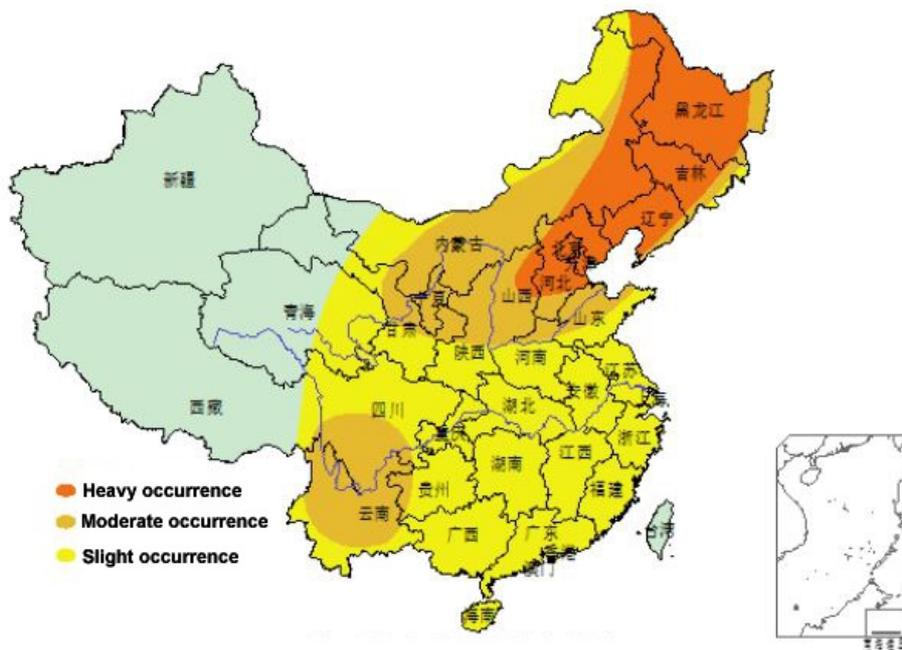
Source: National Agro-Tech Extension and Service Centre

Picture 4: Prediction of rice blast occurrence for 2017



Source: National Agro-Tech Extension and Service Centre

Picture 5: Prediction of corn northern leaf blight occurrence for 2017



Source: National Agro-Tech Extension and Service Centre

Brief News

Enterprises licensed to produce pesticide technical and formulations in 2016

In 2016, the Ministry of Industry and Information Technology of the People's Republic of China issued two lists of enterprises licensed to produce pesticides technical or formulations. Altogether 15 enterprises were included.

Table 9: Enterprises licensed to produce pesticide technical and formulations in China, 2016

No.	Province/ autonomous region/ municipality	Enterprise	Licensed project	Category	Registered/ production address
1	Anhui	Huangshan Lishen Daily Chemicals Co., Ltd.	90 million mat/a Esbiothrin 25 mg/mat VM and 8 million bottle/a transluthrin 1.2% LV	Formulations (for hygienic use)	Beian Economic Development Zone, She County, Huangshan City, Anhui Province
2	Guangdong	Kaiping Dahao Daily Chemicals Co., Ltd.	Beta-cypermethrin BJ against cockroaches, propoxur RG against cockroaches, fipronil RG against cockroaches, fipronil RG against white ants, hexaflumuron RG against white ants, dimefluthrin MC and brodifacoum RG against rodents	Formulations (for hygienic use)	No.3, Qinwanshan Industrial Park, Magang County, Kaiping City, Guangdong Province
3	Jiangsu	Jiangsu Yong Kai Chem Co., Ltd.	800 t/a Fenoxaprop-P-ethyl 96% TC and 600 t/a clodinafop-propargyl TC	TC	Chemical industrial park of Duigougang Town, Guannan County, Jiangsu Province
4	Jiangsu	Jiangsu Kwin Group Co., Ltd.	10,000 t/a Pesticide formulations	Formulations	Chemical industrial park of Jianhu County Economic Development Zone, Yancheng City, Jiangsu Province
5	Jiangxi	Jiangxi Huihe Chemical Co., Ltd.	2,000 t/a Prochloraz TC	TC	Xinghuo Industrial Park, Yunshan Economic Park, Yongxiu County, Jiujiang City, Jiangxi Province
6	Shandong	Linyi Baolilai Chemical Co., Ltd.	500 t/a Tetramethrin + cypermethrin 0.39% AE and 500 t/a tetramethrin + permethrin 0.50% AE	Formulations (for hygienic use)	Xiaoshanqian Industrial Park, Lanshan District, Linyi City, Shandong City
7	Shandong	Shandong Yuanjie Agri-tech Co., Ltd.	10,000 t/a Chloropicrin	TC	Linyi Economic and Technology Development Zone, Shandong Province
8	Shandong	Shandong Yisheng Industries Co., Ltd.	1,000 t/a Glufosinate-ammonium 95% TC and 2,000 t/a glufosinate-ammonium AS	TC	Huji Town, Jinxiang County, Ji'ning City, Shandong Province (Ji'ning Chemical Industrial Park)
9	Chongqing	Chongqing Huage Bio-chemical Co., Ltd.	5,000 t/a Haloxypop-R-methyl TC and 2,000 t/a fluazifop-P-butyl TC	TC	Salt Chemical Industrial Park, Wanzhou District, Chongqing Municipality
10	Fujian	Fuzhou Yinghe Daily Chemicals Co., Ltd.	500,000 bottle/a Diethyltoluamide RW and 1 million bottle/a diethyltoluamide 10% RC	Formulations (for hygienic use)	F5, Building No.72, Pushangyuan A District, Jinshan Industrial Park, Fuzhou City, Fujian Province
11	Hubei	Sun Shine Chemical Co., Ltd.	300 t/a Pyraclostrobin TC	TC	Jiangdi Rd., Makou Industrial Park, Tian Town, Wuxue City, Hubei Province
12	Hunan	Yueyang Yuheng Chemical Co., Ltd.	600 t/a Thiamethoxam 98% TC	TC	Ruxi Rd., Ruxi Town, Linxiang City, Hunan Province (Binjiang Industrial Demonstration Park)
13	Jiangsu	Lianhe Chemical Technology (Yancheng) Co., Ltd.	500 t/a Bifenthrin 96% TC	TC	Chenjiagang Industrial Park, Xiangshui County, Yancheng City, Jiangsu Province
14	Inner Mongolia	Wuhai Heye Chemical Co., Ltd.	8,000 t/a 2,4-D Na 96% TC and 600 t/a metamitron 96% TC and 200 t/a lufenuron 98% TC	TC	Hexing St., Xilaifeng Industrial Park, Hainan District, Wuhai City, Inner Mongolia Autonomous Region
15	Shanghai	Shanghai WLH Bio-tech Corporation	50 t/a Trichoderma SP 200 million spore/g WP	Formulations	Rm 620, No.351, Guo Shoujing Rd., Pudong New Area, Shanghai

Source: Ministry of Industry and Information Technology of the People's Republic of China

Chinese producers register silthiopham formulations for the first time

On 16 Dec., 2016, Shaanxi Xi'an Meibang Co., Ltd. and Shaanxi Weierqi Crop Protection Co., Ltd. were approved to obtain temporary registration certificates for silthiopham 12% ZX, both for control and prevention of wheat take-all.

This was the first Chinese enterprises to register silthiopham formulations (excluding re-packing registrations). Prior to this, only Monsanto Company (Monsanto) was issued a certificate for silthiopham 125 g/L SC in the country. CNAMPGC-SUMITOMO Agrochemicals Ltd. (Tianjing) obtained re-packing registration for the product.

As of 16 Dec., silthiopham TC were only registered by Monsanto (97.7% TC) and Shijiazhuang Xingbai Bio-engineering Co., Ltd. (Shijiazhuang Xingbai, 98% TC). Among them, Shijiazhuang Xingbai obtained the certificate on 17 Dec., 2015 and was the first Chinese registrant for silthiopham TC.

Silthiopham, a fungicide with outstanding efficacy against take-all on both winter and spring wheat, now enjoys promising market prospects in heavy-stricken regions, such as Henan Province.

Table 10: Valid registrations of silthiopham in China, as of 16 Dec., 2016

No.	Registration No.	Active ingredient	Specification	Expiry date	Registrant
1	PD20080776F150039	Silthiopham	125 g/L SC	2017/6/16	CNAMPGC-SUMITOMO Agrochemicals Ltd. (Tianjing)
2	LS20160417	Silthiopham	12% ZX	2017/12/16	Shaanxi Xi'an Meibang Co., Ltd.
3	LS20160426	Silthiopham	12% ZX	2017/12/16	Shaanxi Weierqi Crop Protection Co., Ltd.
4	PD20080776	Silthiopham	125 g/L SC	2018/6/16	Monsanto Company
5	PD20080775	Silthiopham	97.7% TC	2018/6/16	Monsanto Company
6	PD20152590	Silthiopham	98% TC	2020/12/17	Shijiazhuang Xingbai Bio-engineering Co., Ltd.

Source: Institute for the Control of Agrochemicals, Ministry of Agriculture

Three pesticide enterprises qualified as National Enterprise Technology Centre

In late Dec. 2016, the 23rd list of enterprises recognised as 2016 National Enterprise Technology Centre was released, including the technology centres of three Chinese pesticide enterprises – Jiangsu Huifeng Agrochemical Co., Ltd., Hunan Haili Chemical Industry Co., Ltd. and Zhejiang Lianhe Chemical Technology Co., Ltd.

Following this, these enterprises can not only enjoy tax preferences and favourable policies in accordance with the *Regulations on National Enterprise Technology Centre Qualification*, but also apply for government financial supports, such as special funds and subsidies for technology projects. The recognition as National Enterprise Technology Centre will be favourable for the recruitment of technical talents and R&D of advanced technology, which will be a great impetus for these companies to improve their independent innovation capacity and core competitiveness.

Yet, this won't have great impact on the 2016 financial performance, according to announcements released by the three enterprises.

Yangnong Chemical takes the lead in formulating fluazinam TC industrial standards

On 4 Jan., 2017, the Standardisation Administration of China Petroleum and Chemical Industry Federation (CPCIF) launched the second list of CPCIF industrial standards formulation and piloting projects. In particular, Jiangsu Yangnong Chemical Co., Ltd. (Yangnong Chemical) would take the lead in formulating standards for fluazinam TC (to be finished by 2018).

Fluazinam is one of the company's leading product (600 t/a). As of Jan., a total of 15 enterprises were issued registration certificates of fluazinam TC in China, including one foreign company and 14 domestic companies (of which 10 are based in Jiangsu Province, 2 in Hebei Province, 1 in Zhejiang Province and 1 in Shandong Province).

Table 11: Valid registrations of fluazinam TC in China, as of Jan. 2017

No.	Registration No.	Active ingredient	Specification	Expiry date	Registrant
1	PD20150163	Fluazinam	98% TC	2020/1/14	Shandong Weifang Rainbow Chemical Co., Ltd.
2	PD20161612	Fluazinam	98% TC	2021/12/16	Jiangsu Huifeng Agrochemical Co., Ltd.
3	PD20080181	Fluazinam	94.5% TC	2018/1/3	Ishihara Sangyo Kaisha, Ltd.
4	PD20140685	Fluazinam	97% TC	2019/3/24	Hebei Wanquan Lihua Chemicals Co., Ltd.
5	PD20141525	Fluazinam	98% TC	2019/6/16	Zhejiang Hetian Chemical Co., Ltd.
6	PD20141791	Fluazinam	98% TC	2019/7/14	Shijiazhuang Xingbai Bio-engineering Co., Ltd.
7	PD20142261	Fluazinam	97% TC	2019/10/16	Jiangsu Wei'er Chemical Co., Ltd.
8	PD20150465	Fluazinam	97% TC	2020/3/20	Jiangsu Youjia Crop Protection Co., Ltd.
9	PD20151355	Fluazinam	97% TC	2020/7/30	Huai'an Guorui Chemical Co., Ltd.
10	PD20151727	Fluazinam	98% TC	2020/8/28	Jiangsu Reopent Pesticide Factory Co., Ltd.
11	PD20151762	Fluazinam	97% TC	2020/8/28	MAX (Rudong) Chemicals Co., Ltd.
12	PD20160897	Fluazinam	98% TC	2021/7/27	Nanjing Red Sun Co., Ltd.
13	PD20110763	Fluazinam	97% TC	2021/8/23	Youth Chemical Co., Ltd.
14	PD20161036	Fluazinam	98% TC	2021/8/30	Lianyungang Hetian Chemical Co., Ltd.
15	PD20120024	Fluazinam	98% TC	2022/1/9	Jiangsu Taizhou Bailly Chemical Co., Ltd.

Source: Institute for the Control of Agrochemicals, Ministry of Agriculture

Azoxystrobin registered for wheat take-all for the first time in China

On 7 Jan., 2017, Shaanxi Sunger Road Bio-Science Co., Ltd. obtained a temporary registration certificate for azoxystrobin 15% FS, targeted at wheat take-all. This was the first azoxystrobin formulation approved for controlling and preventing the disease in China.

For long, wheat take-all has been hard to deal with and only a few high efficacy pesticides have showed high efficacy against it. The newly registered azoxystrobin formulation mainly works through seed dressing. If it turns out to be effective in practice, it will be promoted in seriously-stricken planting areas.

As of Jan. a total of four azoxystrobin formulations were approved to be applied on wheat, all in temporary registration.

Table 12: Valid registrations of azoxystrobin on wheat in China, as of Jan. 2017

No.	Registration No.	Active ingredient	Specification	Target	Registrant
1	LS20140070	Flutriafol + azoxystrobin	40% SC	Wheat powdery mildew and rice sheath blight	Shanghai Yuelian Chemical Ltd.
2	LS20160313	Azoxystrobin + fludioxonil	4% CF	Wheat sheath blight	Nantong Liannong Jiatian Crop Sciences Co., Ltd.
3	LS20160404	Azoxystrobin + prochloraz + thiamethoxam	30% FS	Wheat: common root rot, smut and aphids on wheat; Peanut: root rot and aphids	Jiangsu Huifeng Agrochemical Co., Ltd.
4	LS20170003	Azoxystrobin	15% FS	Wheat take-all	Shaanxi Sunger Road Bio-Science Co., Ltd.

Source: Institute for the Control of Agrochemicals, Ministry of Agriculture

Jiangxi Heyi to purchase 49% of shares in Changlong Agrochemical

On 10 Jan., 2017, Jiangxi Heyi Chemical Co., Ltd. (Jiangxi Heyi) announced that it had signed an agreement with Shenzhen Rongxin South Investment Co., Ltd. (Rongxin South), Jiangsu Changlong Agrochemical Co., Ltd. (Changlong Agrochemical) and Jiangsu Changlong Chemicals Co., Ltd. (Jiangsu Changlong) for the purchase of Rongxin South's 49% stake in Changlong Agrochemical.

"This acquisition aims to expand and complete our businesses. No negative impacts will be brought to our financial performance," said Jiangxi Heyi.

Changlong Agrochemical is mainly engaged in the production, sales and import & export of pesticide technical and formulations. Jiangxi Heyi, which is also a producer of pesticide technical, intermediates and formulations, has kept doing business with Changlong Agrochemical in recent years. Financial reports from Jiangxi Heyi showed that, the sum paid to Changlong Agrochemical for raw material purchase stood at USD35,041, USD4,336, USD318,226 and USD18,018 in 2013, 2014, 2015 and H1 2016 respectively.

Hailir listed on Shanghai Stock Exchange

On 12 Jan., 2017, Hailir Pesticides and Chemicals Group (Hailir) launched its public initial offerings on the Shanghai Stock Exchange, stocks traded under the name of Hailir (stock code: 603639).

"In the coming period, we will stick to our business strategies and prioritise the development of pesticide technical and formulations. Particularly, emphasis will be placed on developing new chemical compounds to consolidate our leading position in the pesticide intermediates, technical and formulation markets, diversify the existing product portfolio as well as improve profitability and anti-risk capability," said the company.

Lianhetech: fluxapyroxad intermediate project starts up

On 17 Jan., 2017, Zhejiang Lianhe Chemical Technology Co., Ltd. (Lianhetech) released its 2015 private placement report & listing announcement. It is revealed that its 1,000 t/a LH-1 technological upgrading project had started. With a total investment of USD43.27 million – RMB300.70 million (USD93,657 – RMB650,900 invested already), this project will be put into production at 80% capacity in the first year and then at full capacity in the coming year (construction period: one year).

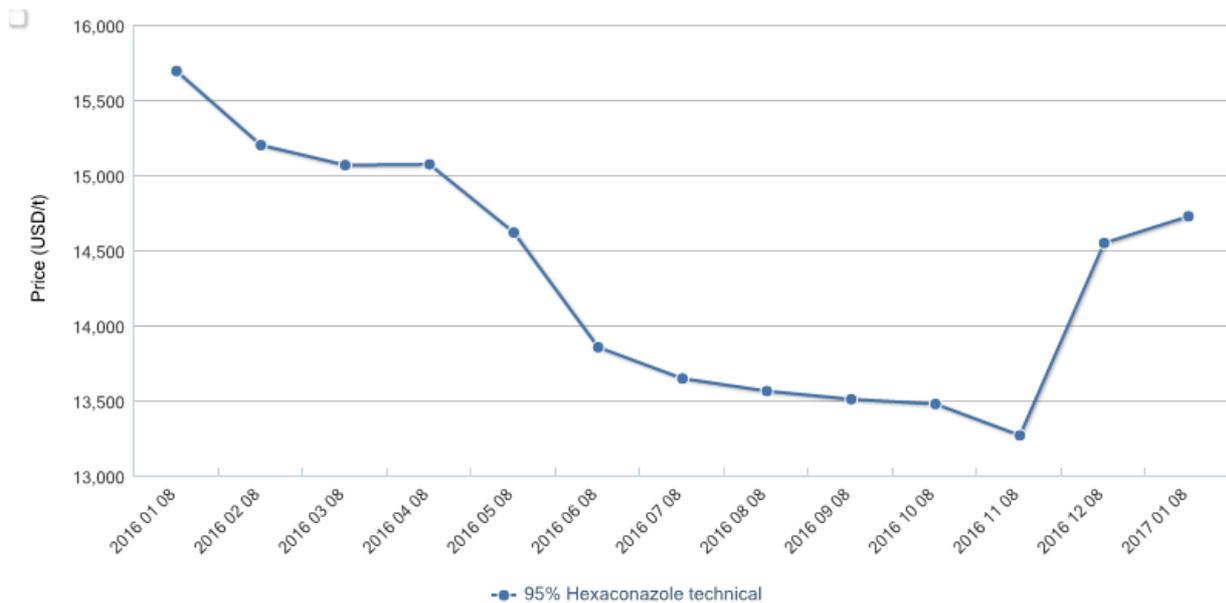
LH-1 is an important pesticide intermediate used to formulate SDHI fungicides, mainly fluxapyroxad (a systematic fungicide with lasting and targeted efficacy, especially fungi with resistance to triazole and strobilurin fungicides) at present.

Hexaconazole TC price continues going up in China in Jan. 2017

China's hexaconazole TC price realised a turnaround in Dec. 2016 and this upward trend continued on into Jan. 2017, although the growth slowed down. According to CCM's price monitoring, the ex-works price of hexaconazole 95% TC averaged USD14,727/t, up USD178/t over the figure in Dec. and up USD1,459/t (= 11%) over the lowest point in Nov. 2016.

As the Chinese Spring Festival (from late Jan. to early Feb.) approaches, most producers suspended accepting new orders, which supported the price to some extent.

Figure 4: Ex-works price of hexaconazole 95% TC in China, Jan. 2016-Jan. 2017



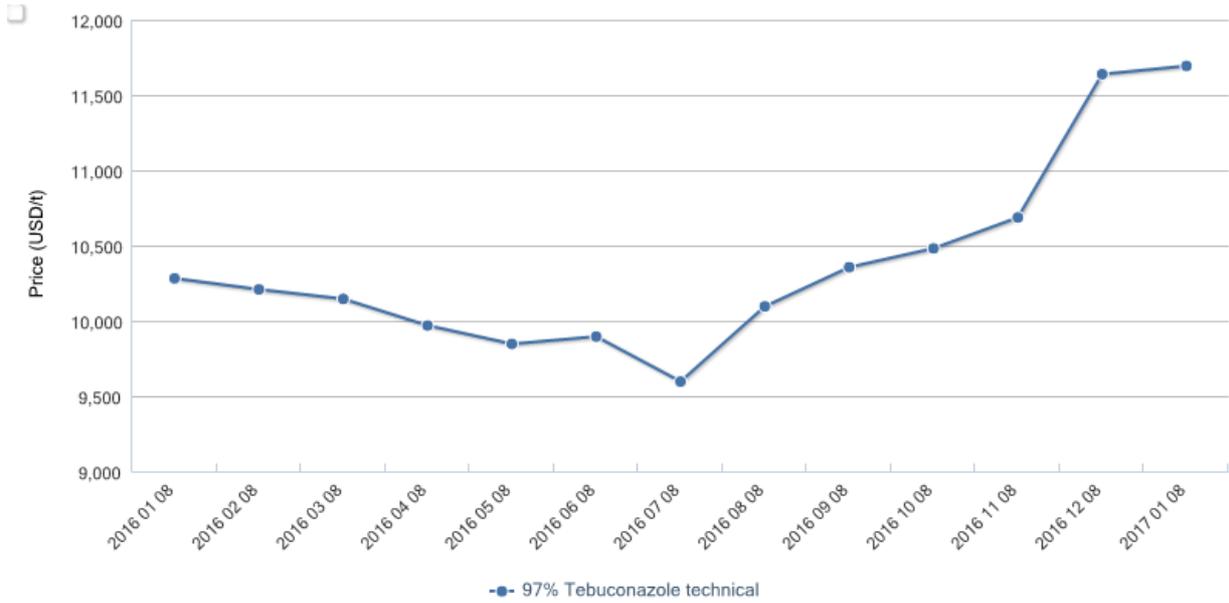
Source: CCM

China's tebuconazole TC price keeps rising in Jan. 2017

As of Jan. 2017, the price of tebuconazole TC remained upward in the Chinese market. According to CCM's price monitoring, the ex-works price of tebuconazole 97% TC averaged USD11,695/t, up USD55/t over Dec. 2016 and up 21.85% over the lowest point in July 2016.

Such continual increases were mainly affected by the depleting inventories, low operating rates among producers and rising prices of intermediates.

Figure 5: Ex-works price of tebuconazole 97% TC in China, Jan. 2016-Jan. 2017

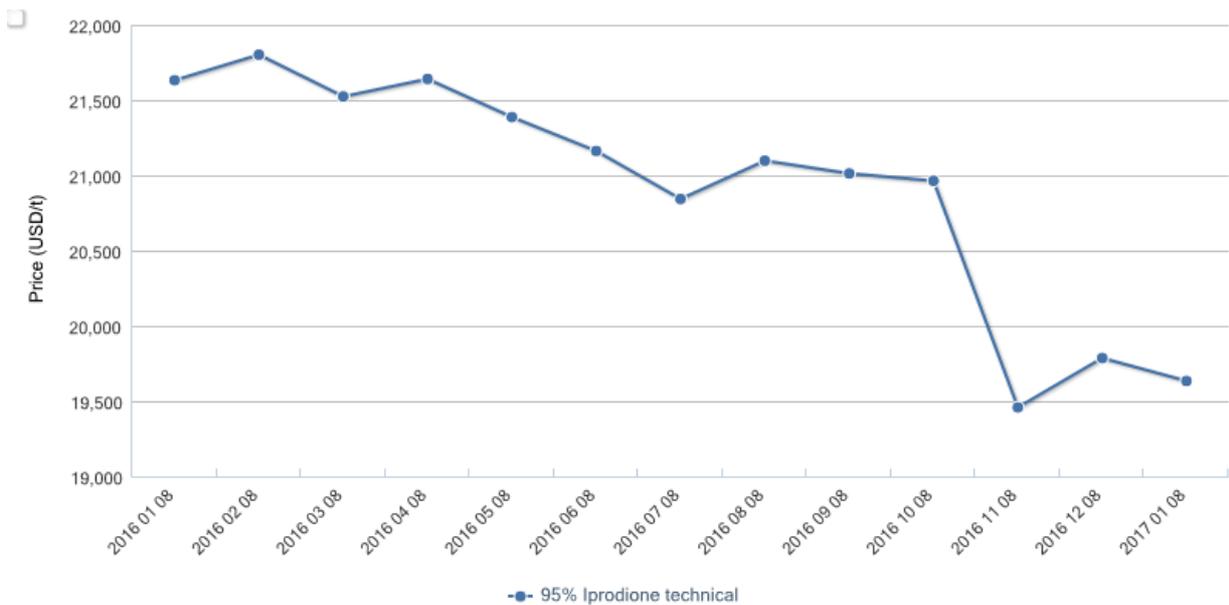


Source: CCM

Chinese iprodione TC producers raise quotations in Jan. 2017

In Jan. 2017, the supply of iprodione TC was tightened in the Chinese market, as the inventories was depleting. In this context, many domestic producers started to raise their quoted prices. According to CCM's price monitoring, the average ex-works price of iprodione 95% TC reached USD19,636/t, up USD176/t over the figure in Nov. 2016. Prior to this recovery, the iprodione TC price remained downward until Dec. 2016, when the market finally turned around.

Figure 6: Ex-works price of iprodione 95% TC in China, Jan. 2016-Jan. 2017



Source: CCM



China increases MRL standards for pesticide in foods

In Dec. 2016, the *National Food Safety Standard - Maximum Residue Limits (MRLs) for Pesticides in Foods* (GB 2763-2016) came into force. The new standards prescribe 4,140 MRLs, an increase of 490 compared with the 2014 edition, for altogether 433 kinds of pesticides. Basically, common pesticides approved for agricultural use and main agricultural produce in daily life are covered.

Highlights of the new standards included:

1. Formulating 184 MRLs for 24 restricted / banned pesticides, which can serve as a reference to control of these products;
2. Exempting MRLs for 33 pesticides that are found no dietary risks, making the MRL regulations more scientific, practical and systemic;
3. Issuing 106 other national standards for pesticide residue detection, apart from the detection methods for prescribed MRLs.

Price Update

Ex-works prices of main fungicides in China, Jan. 2017



Table 13: Ex-works prices of main fungicides in China, Jan. 2017

No.	Product	20161208		20170108	
		RMB/t	USD/t	RMB/t	USD/t
1	96% Azoxystrobin Technical	176,000	25,607.08	173,000	24,977.62
2	98% Carbendazim technical (White color)	33,000	4,801.33	35,000	5,053.28
3	98% Chlorothalonil technical	35,000	5,092.32	35,800	5,168.78
4	98% Cymoxanil technical	53,000	7,711.22	56,000	8,085.24
5	95% Difenoconazole technical	140,000	20,369.27	145,000	20,935
6	98% Dimethomorph technical	79,000	11,494.09	79,000	11,405.97
7	97% Epoxiconazole technical	350,000	50,923.16	358,000	51,687.79
8	95% Flusilazole technical	200,000	29,098.95	198,000	28,587.1
9	95% Hexaconazole technical	100,000	14,549.48	102,000	14,726.69
10	97% Hymexazol technical	118,000	17,168.38	120,000	17,325.52
11	95% Iprodione technical	136,000	19,787.29	136,000	19,635.59
12	97% Isoprothiolane technical	30,000	4,364.84	30,000	4,331.38
13	Mancozeb 80% WP	17,000	2,473.41	17,000	2,454.45
14	90% Mancozeb technical	18,800	2,735.3	18,800	2,714.33
15	98% Metalaxyl technical	90,000	13,094.53	93,000	13,427.28
16	97% Myclobutanil technical	118,000	17,168.38	118,000	17,036.76
17	97% Phosethyl Al technical	19,200	2,793.5	19,300	2,786.52
18	97% Prochloraz technical	57,000	8,293.2	57,000	8,229.62
19	98% Propamocarb technical	46,500	6,765.51	47,000	6,785.83
20	95% Propiconazole technical	106,000	15,422.44	110,000	15,881.72
21	85% Propineb technical	30,100	4,379.39	30,200	4,360.26
22	97% Tebuconazole technical	80,000	11,639.58	81,000	11,694.72
23	96% Thiophanate-methyl technical (White color)	27,500	4,001.11	28,200	4,071.5
24	97% Thiram technical	13,000	1,891.43	13,800	1,992.43
25	95% Triadimefon technical	46,500	6,765.51	47,500	6,858.02
26	95% Tricyclazole technical	52,500	7,638.47	52,500	7,579.91
27	96% Trifloxystrobin technical	490,000	71,292.43	490,000	70,745.86

Note: The content of hexamethylbenzene in 98% chlorothalonil technical is 40 ppm. Ex-works price includes VAT.

Source: CCM

Shanghai Port prices of main fungicides in China, Jan. 2017

Table 14: Shanghai Port prices of main fungicides in China, Jan. 2017

No.	Product	20161208		20170108	
		RMB/t	USD/t	RMB/t	USD/t
1	96% Azoxystrobin Technical	176,480	25,676.91	173,480	25,046.92
2	98% Carbendazim technical (White color)	33,480	4,871.16	35,480	5,122.58
3	98% Chlorothalonil technical	35,480	5,162.15	36,280	5,238.08
4	98% Cymoxanil technical	53,480	7,781.06	56,480	8,154.54
5	95% Difenoconazole technical	140,480	20,439.1	145,480	21,004.3
6	98% Dimethomorph technical	79,480	11,563.92	79,480	11,475.27
7	97% Epoxiconazole technical	350,480	50,993	358,480	51,757.1
8	95% Flusilazole technical	200,480	29,168.79	198,480	28,656.41
9	95% Hexaconazole technical	100,480	14,619.31	102,480	14,795.99
10	97% Hymexazol technical	118,480	17,238.22	120,480	17,394.82
11	95% Iprodione technical	136,480	19,857.12	136,480	19,704.89
12	97% Isoprothiolane technical	30,480	4,434.68	30,480	4,400.68
13	95% Kresoxim-methyl benzene technical	217,480	31,642.2	219,480	31,688.37
14	Mancozeb 80% WP	17,480	2,543.25	17,480	2,523.75
15	90% Mancozeb technical	19,280	2,805.14	19,280	2,783.63
16	98% Metalaxyl technical	90,480	13,164.37	93,480	13,496.58
17	97% Myclobutanil technical	118,480	17,238.22	118,480	17,106.06
18	97% Phosethyl AI technical	19,680	2,863.34	19,780	2,855.82
19	97% Prochloraz technical	57,480	8,363.04	57,480	8,298.92
20	98% Propamocarb technical	46,980	6,835.34	47,480	6,855.13
21	95% Propiconazole technical	106,480	15,492.28	110,480	15,951.03
22	85% Propineb technical	30,580	4,449.23	30,680	4,429.56
23	97% Tebuconazole technical	80,480	11,709.42	81,480	11,764.03
24	96% Thiophanate-methyl technical (White color)	27,980	4,070.94	28,680	4,140.8
25	97% Thiram technical	13,480	1,961.27	14,280	2,061.74
26	95% Triadimefon technical	46,980	6,835.34	47,980	6,927.32
27	95% Tricyclazole technical	52,980	7,708.31	52,980	7,649.22
28	96% Trifloxystrobin technical	490,480	71,362.27	490,480	70,815.17

Note: Shanghai Port price = ex-works price + transportation fee from warehouse to Shanghai Port, and the ex-works price includes VAT.

Source: CCM

FOB Shanghai prices of main fungicides in China, Jan. 2017

Table 15: FOB Shanghai prices of main fungicides in China, Jan. 2017

No.	Product	20161208 USD/t	20170108 USD/t
1	96% Azoxystrobin Technical	24,171.94	23,580.32
2	98% Carbendazim technical (White color)	4,655.04	4,890.22
3	98% Chlorothalonil technical	5,119.08	5,192.51
4	98% Cymoxanil technical	7,674.02	8,037.74
5	95% Difenconazole technical	19,258.59	19,788.12
6	98% Dimethomorph technical	10,933.2	10,849.38
7	97% Epoxiconazole technical	47,919.77	48,635.88
8	95% Flusilazole technical	27,447.5	26,966.2
9	95% Hexaconazole technical	13,799.32	13,964.4
10	97% Hymexazol technical	16,255.99	16,402.24
11	95% Iprodione technical	18,712.67	18,569.2
12	97% Isoprothiolane technical	4,409.37	4,375.57
13	95% Kresoxim-methyl benzene technical	30,952.35	30,996.76
14	Mancozeb 80% WP	2,564.14	2,544.48
15	90% Mancozeb technical	2,819.63	2,798.02
16	98% Metalaxyl technical	12,434.5	12,745.48
17	97% Myclobutanil technical	16,255.99	16,131.37
18	97% Phosethyl Al technical	2,876.41	2,868.44
19	97% Prochloraz technical	7,930.6	7,869.8
20	98% Propamocarb technical	6,751.4	6,770.07
21	95% Propiconazole technical	14,618.21	15,047.88
22	85% Propineb technical	4,423.57	4,403.74
23	97% Tebuconazole technical	11,069.68	11,120.25
24	96% Thiophanate-methyl technical (White color)	4,054.52	4,122.03
25	97% Thiram technical	1,996.37	2,093.75
26	95% Triadimefon technical	6,497.54	6,583.17
27	95% Tricyclazole technical	7,316.43	7,260.34
28	96% Trifloxystrobin technical	69,702.27	69,167.89

Note: FOB Shanghai price considers factors of Shanghai Port price, port sur-charges, loading charges, traders' profits and export rebates. The shipment cost shall be paid by the buyer.

Source: CCM

Journalist: Xiao Zhou, Zaoqun Chen

Editor: Lori Luo

Chief Editor: Shuanglin He

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17th Floor, Huihua Commercial & Trade Building, No.80 XianlieZhong Road Guangzhou, 510070, P.R.China

Tel: +86-20-37616606

Fax: +86-20-37616768

E-mail: econtact@cnchemicals.com

Website: www.cnchemicals.com