

Production and Market of Cyproconazole in China

Researched & Prepared by:

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Executive summary

China is one of key suppliers of cyproconazole products in the world though China is not a large consuming country of cyproconazole products. As of 2021, there are four major cyproconazole technical manufacturers in China. Total capacity of cyproconazole technical in China reached 1,700 t/a in 2021, up from the 1,550 t/a during 2018–2020. And in 2018 and 2020, annual output of cyproconazole technical was some 485 tonnes and 450 tonnes, respectively.

At present, production methods of cyproconazole technical are immature in China. Though some cyproconazole technical manufacturers have tried to produce a key intermediate for cyproconazole technical, namely (1-(4-chlorophenyl)-2-cyclopropyl-1-propanone (PPT) by themselves, they tend to outsource it more often. Sometimes cyproconazole technical manufacturers even purchase cyproconazole technical directly from PPT suppliers.

Cyproconazole technical products in China are mostly exported. Major destinations include Russia, Brazil, Paraguay, Argentina and India. Most of the products for exports are technical; a small number are SC formulations. It's estimated the export volume of cyproconazole technical (converted to 100% AI) from China will continue to see growth.

With more demand from abroad, the ex-works price of cyproconazole technical in China is expected to enjoy growth in 2022. Although the annual average ex-works price of cyproconazole technical witnessed uptrend in China during 2018–2020, the monthly ex-works price went down since early 2020. A general downtrend continued during Jan.–Aug. 2021, but in late 2021, the ex-works price rebounded.

Methodology

The report is drafted by diverse methods as follows:

- Desk research

The sources of desk research are various, including published magazines, journals, government websites and statistics, industrial statistics, association seminars as well as information from the Internet. A lot of work has gone into the compilation and analysis of the obtained information.

- Internet

CCM visited government websites and contacted with players in the domestic agrochemical industry through B2B websites and software as well as obtained registration information on the internet.

- Data processing and presentation

The data collected and compiled are sourced from:

- CCM's database
- Published articles in periodicals, magazines, journals and third-party databases
- Statistics from governments and international institutes
- Telephone interviews with domestic producers, joint ventures, service suppliers and governments
- Third-party data providers
- Comments from industrial experts
- Professional databases from other sources
- Information from the internet

The data from various sources have been combined and cross-checked to make this report as precise and scientific as possible. Throughout the process, a series of internal discussions were held in order to analyse the data and draw the conclusions.

Table null-1 USD/CNY exchange rate, Jan. 2016–Nov. 2021

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
2016	6.5527	6.5311	6.5064	6.4762	6.5315	6.5874	6.6774	6.6474	6.6715	6.7442	6.8375	6.9182	6.6425
2017	6.8918	6.8713	6.8932	6.8845	6.8827	6.8019	6.7772	6.7148	6.5909	6.6493	6.6300	6.6067	6.7662
2018	6.5079	6.3045	6.3352	6.2764	6.3670	6.4078	6.6157	6.8293	6.8347	6.8957	6.9670	6.9431	6.6070
2019	6.8482	6.7081	6.6957	6.7193	6.7344	6.8896	6.8716	6.8938	7.0883	7.0726	7.0437	7.0262	6.8826
2020	6.9614	6.9249	6.9811	7.0771	7.0690	7.1315	7.0710	6.9980	6.8498	6.7796	6.7050	6.5921	6.9284
2021	6.5408	6.4623	6.4754	6.5584	6.4895	6.3572	6.4709	6.4660	6.4680	6.4604	6.4192	6.3693	6.4615

Source: The People's Bank of China

1 Supply of cyproconazole TC in China

Cyproconazole, developed by Sandoz AG, is a triazole fungicide and a sterol demethylation inhibitor. With wide spectrum and excellent compatibility, cyproconazole has become a market leader in grain and soybean fungicides. In 2014, the global sales volume of cyproconazole surpassed that of epoxiconazole, tebuconazole and difenoconazole, and became the leader of triazole fungicides in the global market. At present, cyproconazole is widely registered in the US, the UK, Australia, New Zealand, Japan and South America.

In China however, it has not been mass-produced and promoted, though some manufacturers began to register cyproconazole products in 2012. Demand for cyproconazole technical in China has been quite small. According to CCM's investigation, only a small amount is used domestically as it is mostly replaced by propiconazole in use. Therefore, cyproconazole technical products produced in China are mainly for export. From 2018 to 2021E, China's annual output of cyproconazole technical is about 300 tonnes–500 tonnes.

1.1 Manufacturers of cyproconazole TC

As of December 2021, there are four major manufacturers in active production of cyproconazole technical in China; they all have registered cyproconazole technical products. And in total, 10 registrants have registration certificates of cyproconazole technical within validity period in China. Among them, some occasionally make sample production or get involved in resale, such as Huai'an Glory Chemical Co., Ltd. and Jiangsu Agrochem Laboratory Co., Ltd.

Table 1.1-1 Registrations of cyproconazole technical in China, as of Dec., 2021

No.	Registration number	Content	Registrant
1	PD20161262	95%	Jiangsu Fengdeng Crop Science Co., Ltd.
2	PD20182818	95%	Zhejiang Udragon Bioscience Co., Ltd.
3	PD20180948	95%	Xiangshui Zhongshan Bioscience Co., Ltd.
4	PD20172222	95%	Jiangsu Chengyang Crop Science Co., Ltd.
5	PD20172201	95%	Rudong Zhongyi Chemical Co., Ltd.
6	PD20172122	95%	Jiangsu Agrochem Laboratory Co., Ltd.
7	PD20172064	98%	Jiangsu Sevencontinent Green Chemical Co., Ltd.
8	PD20172001	95%	Huanglong Biotechnology (Liaoning) Co., Ltd.
9	PD20171937	95%	Jiangsu Sword Agrochemicals Co., Ltd.
10	PD20171864	95%	Huai'an Glory Chemical Co., Ltd.

Source: The Institute for the Control of Agrochemicals, Ministry of Agriculture of the People's Republic of China (ICAMA)

Table 1.1-2 Situation of all cyproconazole technical manufacturers in China

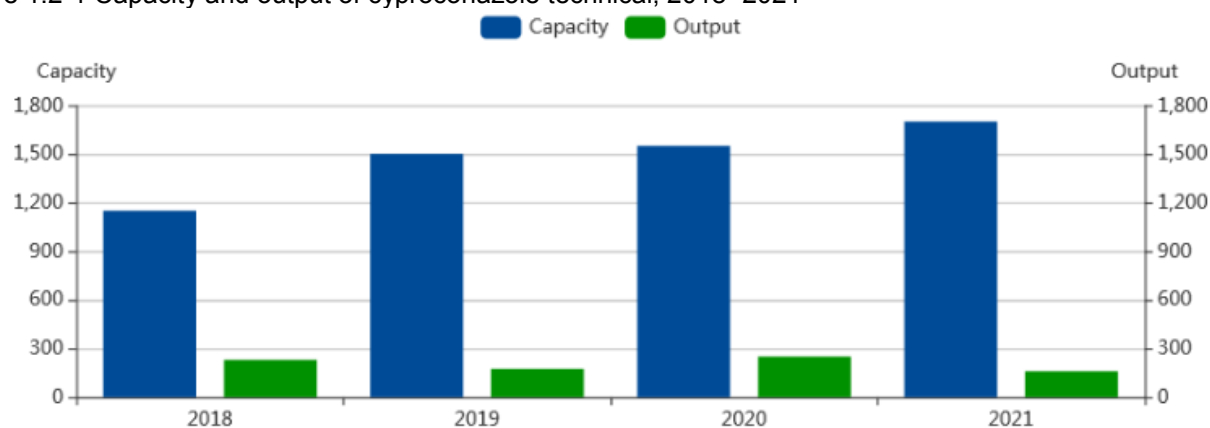
No.	Manufacturer	Abbreviation	Location	Establishment date	Status, 2021
1	Zhejiang Udragon Bioscience Co., Ltd.	Zhejiang Udragon	Zhejiang	September, 1978	Active
2	Jiangsu Sword Agrochemicals Co., Ltd.	Jiangsu Sword	Jiangsu	January, 2001	Active
3	Jiangsu Sevencontinent Green Chemical Co., Ltd.	Jiangsu Sevencontinent	Jiangsu	May, 1998	Active
4	Rudong Zhongyi Chemical Co., Ltd.	Rudong Zhongyi	Jiangsu	December, 1993	Active

Source: CCM

1.2 Capacity and output of cyproconazole TC, 2018–H1 2021

The capacity of cyproconazole technical in China expanded to 1,700 t/a as of August 2021, up from the 1,550 t/a during 2018–2020. And in 2018 and 2020, annual output of cyproconazole technical was some 485 tonnes and 450 tonnes, respectively. In 2019, however, the output was 315 tonnes, affected by sluggish global demand, as well as the major explosion in a chemical park Jiangsu Province in March 2019. The explosion prompted local government to completely halt production in agrochemical enterprises for rectification.

Figure 1.2-1 Capacity and output of cyproconazole technical, 2018–2021



Note: Figures in 2021 are estimated.

Source: CCM

Table 1.2-1 Capacity and output of cyproconazole TC, 2018–H1 2021

No.	Producer	H1 2021		2020		2019		2018	
		Capacity, t/a	Output, tonne	Capacity, t/a	Output, tonne	Capacity, t/a	Output, tonne	Capacity, t/a	Output, tonne
1	Jiangsu Sevencontinent Green Chemical Co., Ltd.	600	170	600	280	600	210	600	380
2	Jiangsu Sword Agrochemicals Co., Ltd.	500	80	500	70	500	50	500	50
3	Zhejiang Udragon Bioscience Co., Ltd.	200	10	50	10	50	5	50	5
4	Rudong Zhongyi Chemical Co., Ltd.	200	0	200	40	200	0	200	0
Others		200	50	200	50	200	50	200	50
Total		1,700	310	1,550	450	1,550	315	1,550	485

Source: CCM

Jiangsu Sevencontinent Green Chemical Co., Ltd. is the controlling shareholder of Jiangsu Chengyang Crop Science Co., Ltd. (Jiangsu Chengyang), with Jiangsu Fengdeng Crop Science Co., Ltd. jointly investing in Jiangsu Chengyang. In 2018, Jiangsu Chengyang completed expansion of a cyproconazole production line, increasing the capacity from 200 t/a to 600 t/a, and began commissioning production in October.

Previously in 2014, Jiangsu Sevencontinent planned to build 800 t/a cyproconazole capacity. However, its actual capacity is 600 t/a now, according to the latest investigation. The specific date has not been announced for this capacity expansion plan.

In 2021, Zhejiang Udragon Bioscience Co., Ltd. announced a technological reform project of pesticide technical production, in which the capacity of cyproconazole was expanded from 50 t/a to 200 t/a.

2 Demand abroad

Global demand for cyproconazole has not grown much in recent years.

In European Union (EU), cyproconazole was banned this year because potential endocrine disrupting effects cannot be ruled out previously (according to the EU's endocrine disruptor identification regulation) and no further application has been submitted for review. Although the main exporting destinations for China's cyproconazole products are Russia, Brazil, Argentina and etc., a small number went to the EU countries, and thus the demand abroad will slightly be affected.

2.1 Export of cyproconazole, 2018–Aug. 2021

- By month

From 2019 to Aug. 2021, the export volume of cyproconazole technical (converted to 100% AI) from China has seen growth. But the export volume decreased in 2019, compared with that in 2018 because of serious safety production inspection resulting in low output in China in 2019. Currently, the export volume of cyproconazole technical is on the rise in China. And 2021 will see increase in China's export volume of cyproconazole technical, compared with that in 2020.

Table 2.1-1 China's exports of cyproconazole technical by month, Jan. 2020–Aug. 2021

Month	2020					2021				
	95% Tech.		98% Tech.		Share in total volume (based on 100% AI)	95% Tech.		98% Tech.		Share in total volume (based on 100% AI)
	Volume (tonne)	Unit price (USD/kg)	Share in total volume (based on 100% AI)	Volume (tonne)		Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	
Jan.	46.225	72.26	0.000	/	9.82%	16.300	54.11	50.055	100.68	18.31%
Feb.	14.000	67.62	0.000	/	2.97%	21.785	56.75	0.000	/	5.87%
March	75.950	71.29	0.000	/	16.13%	15.500	54.74	0.000	/	4.18%
April	62.450	69.14	0.000	/	13.27%	115.120	62.16	0.000	/	31.03%
May	38.775	66.81	5.000	69.53	9.33%	48.725	61.72	0.000	/	13.13%
June	27.900	72.81	0.000	/	5.93%	12.525	49.57	0.000	/	3.38%
July	10.250	69.67	0.000	/	2.18%	85.575	50.46	0.000	/	23.07%
Aug.	20.625	60.05	0.000	/	4.38%	3.800	50.32	0.000	/	1.02%
Sept.	20.200	65.59	12.000	56.80	6.92%	-	-	-	-	-
Oct.	36.300	83.16	0.000	/	7.71%	-	-	-	-	-
Nov.	67.275	67.01	0.000	/	14.29%	-	-	-	-	-
Dec.	33.300	56.45	0.000	/	7.07%	-	-	-	-	-
Total	453.250	68.49	17.000	63.17	100.00%	319.330	54.98	50.055	100.68	100.00%

Note: Some export records are missing in the export data of 2020 and 2021 as some countries did not release.

Source: Tranalysis

Table 2.1-2 China's exports of cyproconazole technical by month, 2019

Month	95% Tech.		98% Tech.		Share in total volume (based on 100% AI)
	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	
Jan.	6.125	47.23	3.000	44.27	3.48%
Feb.	21.900	49.13	0.000	/	8.26%
March	57.550	45.43	1.500	47.50	22.30%
April	11.025	46.88	0.000	/	4.16%
May	24.625	47.24	0.000	/	9.29%
June	39.800	58.95	0.000	/	15.02%
July	47.790	72.75	0.000	/	18.03%
Aug.	9.650	78.46	0.000	/	3.64%
Sept.	13.325	73.37	0.000	/	5.03%
Oct.	4.650	73.51	0.025	78.48	1.76%
Nov.	12.935	73.54	0.700	73.60	5.15%
Dec.	10.225	80.20	0.000	/	3.86%
Total	259.600	62.22	5.225	60.96	100.00%

Source: Tranalysis

Table 2.1-3 China's exports of cyproconazole technical by month, 2018

Month	95% Tech.		98% Tech.		Share in total volume (based on 100% AI)
	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	
Jan.	31.750	50.85	17.575	51.95	10.16%
Feb.	14.500	55.64	4.900	51.39	3.98%
March	46.650	52.39	1.800	50.60	9.88%
April	11.425	54.56	1.500	60.79	2.64%
May	33.655	52.85	5.500	57.02	8.01%
June	86.650	53.21	8.000	53.26	19.33%
July	53.250	51.55	4.250	55.91	11.74%
Aug.	41.550	51.95	0.000	/	8.46%
Sept.	44.550	50.13	0.000	/	9.07%
Oct.	16.604	51.13	0.000	/	3.38%
Nov.	19.600	51.84	0.000	/	3.99%
Dec.	45.925	50.08	0.000	/	9.35%
Total	446.109	52.18	43.525	54.42	100.00%

Source: Tranalysis

- By destination

In recent years, main export countries and regions of cyproconazole from China include Russia, Argentina, Paraguay, Brazil, India and Uruguay.

Table 2.1-4 Major destinations of exported cyproconazole technical in China, Jan.–Aug. 2021

No.	Country/region	Quantity (tonne)		Share in total volume (based on 100% AI)
		95% Tech.	98% Tech.	
1	Brazil	122.000	50.005	46.79%
2	Russia	102.535	0.000	27.64%
3	Paraguay	56.900	0.000	15.34%
4	Argentina	20.400	0.000	5.50%
5	India	7.295	0.000	1.97%
6	Costa Rica	6.000	0.000	1.62%
7	Vietnam	2.300	0.050	0.63%
8	Uzbekistan	1.050	0.000	0.28%
9	Turkey	0.850	0.000	0.23%
Total		319.330	50.055	100.00%

Source: Tranalysis

Table 2.1-5 Major destinations of exported cyproconazole technical in China, 2020

No.	Country/region	Quantity (tonne)		Share in total volume (based on 100% AI)
		95% Tech.	98% Tech.	
1	Russia	142.275	17.000	33.95%
2	Argentina	90.100	0.000	19.14%
3	Paraguay	47.500	0.000	10.09%
4	India	38.775	0.000	8.24%
5	Brazil	35.000	0.000	7.43%
6	Ukraine	14.525	0.000	3.09%
7	Uruguay	14.350	0.000	3.05%
8	Poland	13.075	0.000	2.78%
9	Spain	10.000	0.000	2.12%
10	New Zealand	8.000	0.000	1.70%
Others		39.650	0.000	8.42%
Total		453.250	17.000	100.00%

Source: Tranalysis

Table 2.1-6 Major destinations of exported cyproconazole technical in China, 2019

No.	Country/region	Quantity (tonne)		Share in total volume (based on 100% AI)
		95% Tech.	98% Tech.	
1	Argentina	72.640	0.000	27.41%
2	Uruguay	42.150	3.000	17.07%
3	Paraguay	37.300	0.000	14.08%
4	India	36.000	0.000	13.59%
5	Russia	19.400	0.000	7.32%
6	Japan	11.550	0.000	4.36%
7	Belgium	6.000	1.500	2.85%
8	New Zealand	5.000	0.025	1.90%
9	Poland	4.750	0.000	1.79%
10	Australia	4.325	0.000	1.63%
	Others	20.485	0.700	8.00%
	Total	259.600	5.225	100.00%

Source: Tranalysis

Table 2.1-7 Major export destinations of cyproconazole technical from China, 2018

No.	Country/region	Quantity (tonne)		Share in total volume (based on 100% AI)
		95% Tech.	98% Tech.	
1	Uruguay	83.500	8.000	18.69%
2	Argentina	85.125	0.000	17.34%
3	India	81.000	0.000	16.50%
4	Paraguay	61.205	11.250	14.83%
5	Russia	56.804	0.000	11.57%
6	Germany	19.800	0.000	4.03%
7	Poland	7.025	8.575	3.23%
8	Belgium	6.550	9.000	3.22%
9	Japan	10.550	0.400	2.23%
10	New Zealand	7.000	0.000	1.43%
	Others	27.550	6.300	6.93%
	Total	446.109	43.525	100.00%

Source: Tranalysis

- By exporter

Table 2.1-8 Major active exporters of cyproconazole in China, Jan. 2021–Aug. 2021

No.	Exporter	Quantity (tonne)		Share in total volume (based on 100% AI)
		95% Tech.	98% Tech.	
1	Ningbo Youngor International Trade & Transportation Co., Ltd.	48.000	0.000	12.94%
2	At Agro Co., Ltd.	36.000	0.000	9.70%
3	Jiangsu Sevencontinent Green Chemical Co., Ltd.	22.655	0.000	6.11%
4	Qingdao Rainbow Chemical Co., Ltd.	15.925	0.000	4.29%
5	Bioagriland HK Crop Care Co., Ltd.	12.500	0.000	3.37%
6	Jiangsu Sword Agrochemicals Co., Ltd.	12.000	0.000	3.23%
7	Jiangsu Trustchem Co., Ltd.	12.000	0.000	3.23%
8	Shandong Weifang Rainbow Chemical Co., Ltd.	7.350	0.000	1.98%
9	UPL Limited	6.000	0.000	1.62%
10	Zhejiang Hengdian Import and Export Co., Ltd.	6.000	0.000	1.62%
Others		140.900	50.055	51.90%
Total		319.330	50.055	100.00%

Source: Tranalysis

Table 2.1-9 Major active exporters of cyproconazole in China, 2020

No.	Exporter	Quantity (tonne)		Share in total volume (based on 100% AI)
		95% Tech.	98% Tech.	
1	Jiangsu Sevencontinent Green Chemical Co., Ltd.	79.500	12.000	19.52%
2	Qingdao Rainbow Chemical Co., Ltd.	61.575	0.000	13.08%
3	Shandong Weifang Rainbow Chemical Co., Ltd.	55.400	5.000	12.86%
4	Jiangsu Trustchem Co., Ltd.	33.200	0.000	7.05%
5	Ningbo Agroskyrun Trading Co., Ltd.	30.400	0.000	6.46%
6	Yangzhou Pioneer Chemical Co., Ltd.	17.000	0.000	3.61%
7	Rudong Zhongyi Chemical Co., Ltd.	16.625	0.000	3.53%
8	Agrobeats Tech Co., Ltd.	13.875	0.000	2.95%
9	Sinochem Agro Co., Ltd.	12.100	0.000	2.57%
10	Xingfa (Hongkong) Imp. & Exp. Ltd.	9.000	0.000	1.91%
Others		124.575	0.000	26.46%
Total		453.250	17.000	100.00%

Source: Tranalysis

Table 2.1-10 Major active exporters of cyproconazole in China, 2019

No.	Exporter	Quantity (tonne)		Share in total volume (based on 100% AI)
		95% Tech.	98% Tech.	
1	Jiangsu Sevencontinent Green Chemical Co., Ltd.	77.260	1.500	29.74%
2	Qingdao Rainbow Chemical Co., Ltd.	36.365	0.000	13.72%
3	Shanghai E-tong Chemical Co., Ltd.	20.450	0.000	7.72%
4	Nanjing Bioagriland Crop Care Co., Ltd.	18.875	0.000	7.12%
5	HighChem (Nanjing) Company Limited	12.600	0.000	4.75%
6	Ningbo Jiangdong Agroskyrun Trading Co., Ltd.	11.000	0.000	4.15%
7	Ningbo Tide Import and Export Co., Ltd.	10.000	0.000	3.77%
8	Nanjing Taikenuo International Trade Co., Ltd.	8.000	0.000	3.02%
9	Shenzhen Honbor Industrial Co., Ltd.	7.000	0.000	2.64%
10	Shanghai MIO Chemical Co., Ltd.	6.000	0.000	2.26%
Others		52.050	3.725	21.09%
Total		259.600	5.225	100.00%

Source: Tranalysis

Table 2.1-11 China's exports of cyproconazole by exporter, 2018

No.	Exporter	Quantity (tonne)		Share in total volume (based on 100% AI)
		95% Tech.	98% Tech.	
1	Jiangsu Sevencontinent Green Chemical Co., Ltd.	85.130	26.275	22.86%
2	Qingdao Rainbow Chemical Co., Ltd.	63.925	0.000	13.02%
3	China Jiangsu International Economic Technical Cooperation Group Co., Ltd.	48.555	0.000	9.89%
4	Zhejiang Changxing Zhongshan Import and Export Co., Ltd.	30.800	0.000	6.27%
5	Ningbo Jiangdong Agroskyrun Trading Co., Ltd.	14.000	13.250	5.64%
6	Zhejiang Chemicals Import & Export Corporation	27.100	0.000	5.52%
7	High Hope Zhongtian Corporation	25.200	0.000	5.13%
8	Jiangsu Xinnuo Chemicals Co., Ltd.	14.525	0.000	2.96%
9	Shanghai Bingxun International Trade Co., Ltd.	13.000	0.000	2.65%
10	Zhangjiagang Yagro Chemical Co., Ltd.	11.800	0.000	2.40%
Others		112.074	4.000	23.67%
Total		446.109	43.525	100.00%

Source: Tranalysis

2.2 China's position in global cyproconazole supply

China is one of key suppliers of cyproconazole products in the world; about 30%–40% cyproconazole products (including technical and formulation ones, converted into 100% AI) come from China every year.

Those cyproconazole products are mainly sold to Russia, Brazil, Paraguay, Argentina and India.

- China's cyproconazole in Russia

In Russia, China is the largest supplier of cyproconazole products during 2020–2021. More than 95% cyproconazole products in Russia are from China. Cyproconazole products sold to Russia from China are 95% and 98% cyproconazole technical. Besides China, the US and Germany also supply cyproconazole products to Russia, but their supply volume is quite small compared with that from China.

- China's cyproconazole in Brazil

China enjoys relatively small share of cyproconazole business in Brazil market, while countries like Belgium, the UK and the Netherlands hold larger market share. During 2020–2021, Belgium takes the largest market share and the UK comes the second. In addition, Germany also supplies cyproconazole products to Brazil, yet the volume is quite small.

- China's cyproconazole in Paraguay

In Paraguay, China enjoys large market share in cyproconazole business, taking up more than 98% market share based on sales value during 2020–2021. Only small market share is left for other countries, such as the US and Germany. Furthermore, China's sales value in cyproconazole business is still expanding currently.

- China's cyproconazole in Argentina

In Argentina, China is a key supplier of cyproconazole products, providing over 60% of such products. Germany, Switzerland and the US are also suppliers of cyproconazole products in Argentina at present.

- China's cyproconazole in India

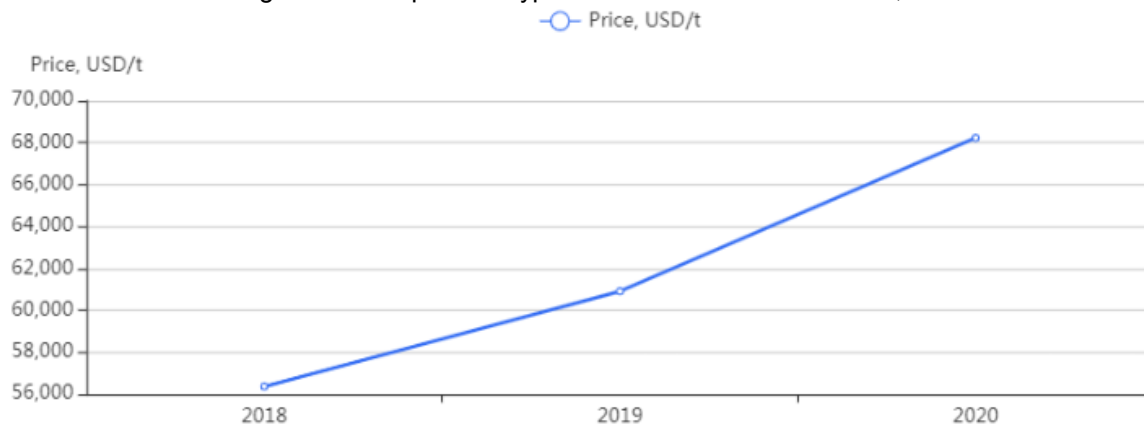
During 2020–2021, China is one of key suppliers of cyproconazole products in India. Currently, China accounts for over 35% market share based on sales value in the country. The majority of market share is held by Germany. Meanwhile, the UK, Switzerland and the US also export some cyproconazole products to India.

3 Price analysis of cyproconazole TC in China

3.1 Monthly price analysis, 2018–Aug. 2021

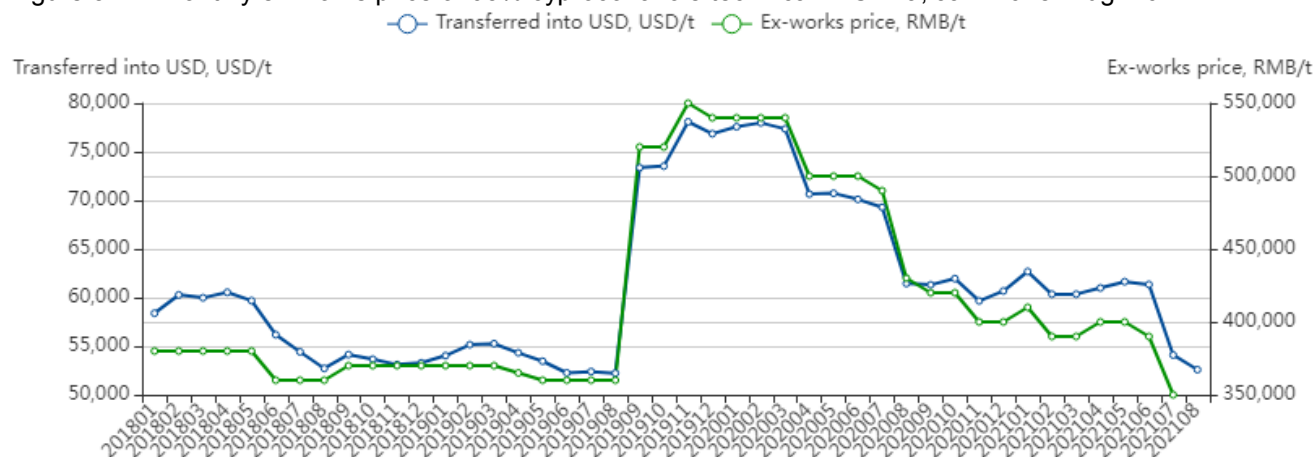
The annual average ex-works price of cyproconazole technical witnessed uptrend in China during 2018–2020. But in fact, monthly ex-works price of cyproconazole technical in China has gone down since early 2020. And the downtrend continued during Jan.–Aug. 2021.

Figure 3.1-1 Annual average ex-works price of cyproconazole technical in China, 2018–2020



Note: The prices in the figure are transferred from the ex-works RMB price of 95% cyproconazole technical into USD price.
Source: CCM

Figure 3.1-2 Monthly ex-works price of 95% cyproconazole technical in China, Jan. 2018–Aug. 2021



Source: CCM

Generally speaking, driving factors for the jump in ex-works price of cyproconazole technical in China are environmental protection and safety production inspections and production restriction rules in winter. Unforeseeable COVID-19 situation may also impact cyproconazole technical production and that will also be a driving factor for price increase. However, small demand at home and abroad restricts price hike in China. Chinese producers of cyproconazole products have to face intense competition with foreign suppliers to earn market share. For them, a high-priced quotation is unwise.

From Jan. 2018 to Aug. 2019, the ex-works price of cyproconazole technical witnessed relatively small fluctuations, from about USD50,000/t to about USD61,000/t. In Sept. 2019, the price soared, due to a tight supply resulted from environmental protection and safety production inspections. In Q4 2019, the price grew further up under tight supply caused by production restriction in winter. It stayed high in Q1 2020 when COVID-19 outbreak called a halt to cyproconazole production and the supply kept tight.

The price gradually reduced starting from April 2020 and fell back to less than USD55,000/t in July 2021. According to domestic cyproconazole technical manufacturers, make-to-order production of cyproconazole technical is a common practice and stock is rare.

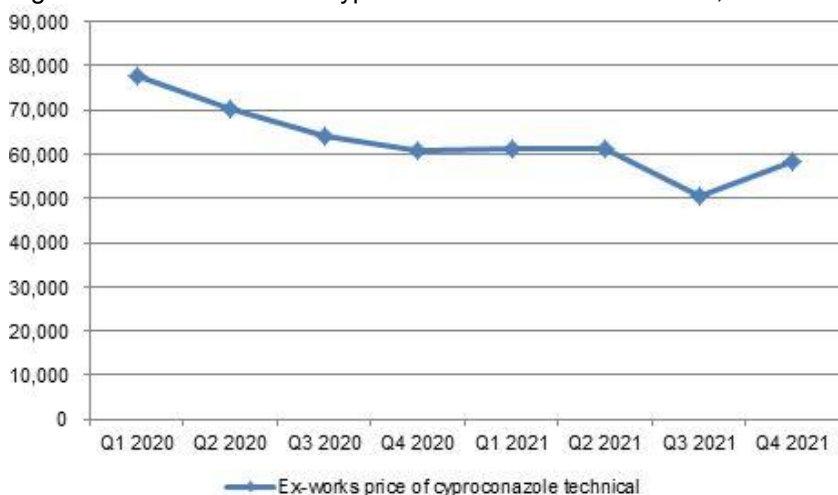
3.2 Price trend

The ex-works price of cyproconazole technical in China saw downtrend during Q1 2020–Q3 2021, but rebounded a little in Q4 2021. It's estimated the ex-works price of cyproconazole technical will see continuous increases in the coming three months. And tight supply of cyproconazole technical and increasing demand will drive up the price in 2022.

Since Sept. 2021, power rationing has led to tight supply of cyproconazole technical in China, bringing up the price of cyproconazole. In late 2021, environmental protection inspections were carried out in China, which has restricted the production of cyproconazole technical. Furthermore, regular winter production suspension orders were released, which will lead to tighter supply in the near future. Thus, it's predicted the ex-works price of cyproconazole technical will see continuous increases in the coming three months.

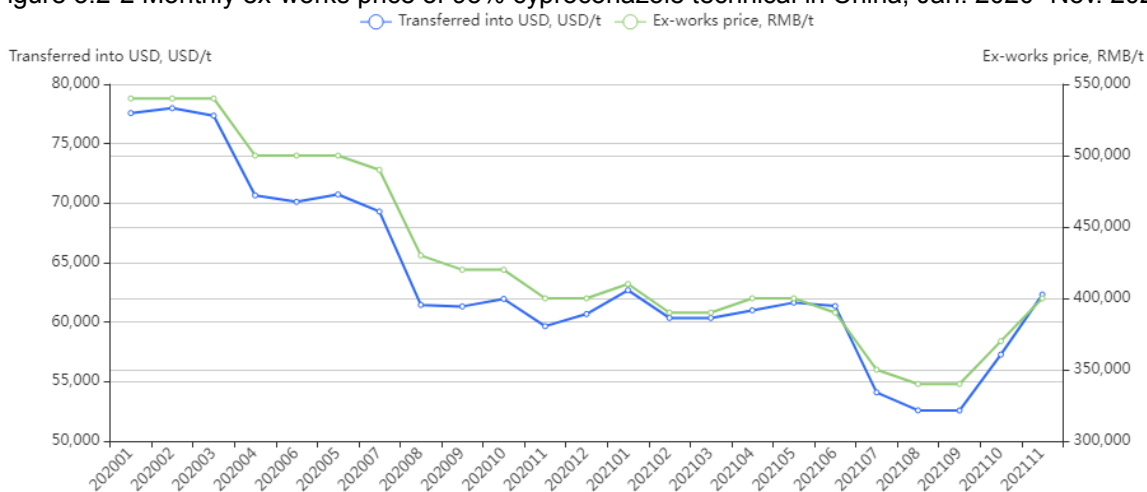
Notably, in recent years, the Chinese government has paid greater attention to environmental protection, safety production and energy saving. These factors will further negatively affect cyproconazole production, and periodic tight supply of cyproconazole technical will be seen. As to demand, it is expected to continue the uptrend experienced in 2019–2021. Therefore, it is believed that the price will continue to go up in the next year.

Figure 3.2-1 Price trend of cyproconazole technical in China, Q1 2020–Q4 2021



Note: The price is based on average ex-works price transferred into USD.
Source: CCM

Figure 3.2-2 Monthly ex-works price of 95% cyproconazole technical in China, Jan. 2020–Nov. 2021



Source: CCM

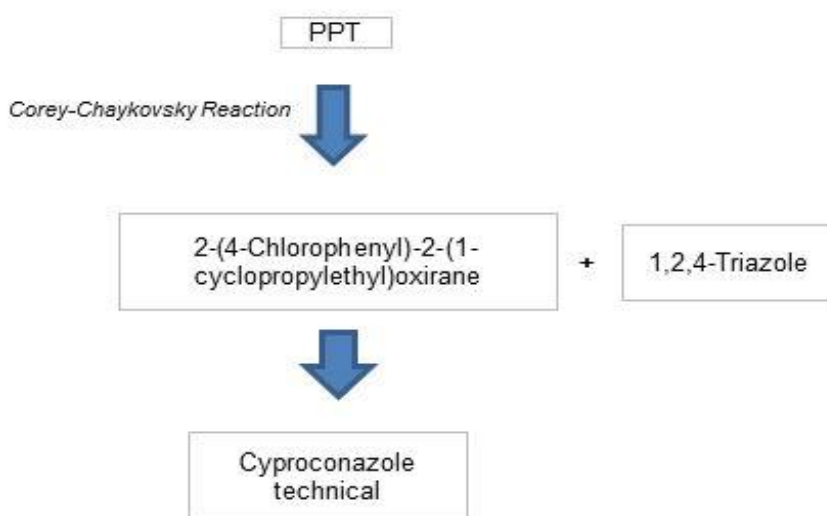
4 Technology and supply of key raw materials of cyproconazole TC in China

4.1 Brief introduction to different methods

Nowadays, there are five production methods for cyproconazole technical in China based on the production methods of 4-chlorophenyl cyclopropyl ketone, namely Grignard method, Friedel-Crafts method, Darzen method, Cyanation method and NaH method. 4-Chlorophenyl cyclopropyl ketone is an important intermediate for 1-(4-chlorophenyl)-2-cyclopropyl-1-propanone (PPT), and PPT has become commonly used as a starting material in the production of cyproconazole technical in China.

However, only Grignard and Darzen methods are used in industrial production of cyproconazole technical in China. Some domestic cyproconazole technical manufacturers try to produce PPT by themselves. Yet notably, most of the cyproconazole technical manufacturers tend to purchase PPT from outside directly instead of producing it by themselves as the production cost and technology requirement are high in PPT production. Some even ask those PPT manufacturers to produce cyproconazole technical for them sometimes.

Picture 4.1-1 Production method of cyproconazole technical in China, as of 2021



Note: Reaction condition and additives for reaction are excluded in this picture.
Source: CCM

Table 4.1-1 Cyproconazole technical manufacturers' production methods in China, as of 2021

Manufacturer	Production method	Remark
Jiangsu Sevenscontinent	Darzen method	It tries Darzen method and outsources PPT at the same time.
Jiangsu Sword	Grignard method	It tries Grignard method and outsources PPT at the same time.
Zhejiang Udragon	Directly purchase PPT from outside	It usually purchases PPT or cyproconazole technical directly from outside.
Rudong Zhongyi	Darzen method	It tries Darzen method and outsources PPT at the same time.

Source: CCM

4.2 Comparison of different production methods

Generally, the production methods of cyproconazole technical are immature in China at present. And the production cost is high mainly for expensive raw materials and high requirement on reaction condition. Among the five production methods, Grignard method and Darzen method have more advantages in yield and reaction condition.

Table 4.2-1 Comparison of five production methods of cyproconazole technical in China, as of 2021

Item	Grignard method	Friedel-Crafts method	Darzen method	Cyanation method	NaH method
Yield	Relatively high	Relatively low	Relatively high	Relatively low	Relatively low
Reaction condition	High requirement	High requirement	Relatively low requirement	High requirement	Relatively low requirement
Process	It's difficult in separation stage.	Complex process and long-time reaction	Relatively simple	Long-time reaction	Relatively simple
Comment	The yield is relatively high though the production cost is relatively high. IOR is OK.	The production cost is high and the yield is low. IOR is bad.	The production cost is relatively low and the yield is relatively high. IOR is relatively good.	The production cost is high and the yield is low. IOR is bad.	The production cost is relatively low and the yield is low. IOR is bad.

Note: "IOR" means Input and Output Ratio.

Source: CCM

4.3 Supply of key raw materials

PPT is a key raw material for cyproconazole technical production in China at present. And most cyproconazole technical manufacturers tend to outsource PPT.

There are not so many PPT suppliers in China, and these suppliers are mainly located in Jiangsu Province and Hubei Province, not far away from cyproconazole technical manufacturers. Most of the suppliers produce PPT according to clients' orders and do not stock much PPT as it is high in production cost and price. Furthermore, these PPT suppliers can also produce cyproconazole technical directly for cyproconazole technical manufacturers.

The ex-works price of PPT is basically over a half of that of cyproconazole technical in China. In 2021, PPT price witnessed downtrend in Q1–Q3, but rebounded in Q4 because of power rationing. In late 2021, its price is still on the rise in China under winter production restriction rules.

Table 4.3-1 Raw material supply in cyproconazole technical manufacturer in China, as of 2021

Manufacturer	Starting material	Remark
Jiangsu Sevencontinent	Cyclopropyl methyl ketone	It also purchases PPT from outside most of the time.
Jiangsu Sword	PPT	Its PPT is mainly from Jiangsu Province.
Zhejiang Udragon	PPT	Its PPT is mainly from Jiangsu Province and Hubei Province.
Rudong Zhongyi	Cyclopropyl methyl ketone	It also purchases PPT from outside most of the time.

Source: CCM

Table 4.3-2 Quarterly ex-works price of PPT in China, 2021

Time	Price, USD/t
Q1	42,613.48
Q2	34,991.02
Q3	34,012.65
Q4	37,460.95

Note: The prices in this table are transferred into USD price from RMB ex-works price.

Source: CCM

5 Profile of major Chinese cyproconazole producers

5.1 Zhejiang Udragon

5.1.1 Basic info

Address: No. 1 Fangjiadai Road, Haiyan Economic Development Zone, Jiaxing City, Zhejiang Province, P. R. China

Tel: +86-571-89188233

Fax: +86-571-89188233

Person to contact: Miss Ren

E-mail: contact@udragon.cn

Website: en.udragon.com.cn

Zhejiang Udragon Bioscience Co., Ltd. (Zhejiang Udragon), founded in 1978, formerly known as Zhejiang Bosst CropScience Co., Ltd., engages in R&D, production and sales of agrochemicals and chemical intermediates, such as fungicides, herbicides and pesticides. It is now a holding subsidiary and production base of Hangzhou Udragon Chemical Co., Ltd. (Hangzhou Udragon).

Zhejiang Udragon has its own technical team, with more than 100 sets of production equipment. It mainly relies on independent research and development, and now holds 20 patents for invention.

The company is one of the state designated pesticide manufacturers, and has been on the list of Top 100 pesticide enterprises in China since 2015.

Table 5.1.1-1 Company info of Zhejiang Udragon, as of Dec. 2020

Time of establishment	1978	Enterprise type	private
Staff	300	Registered capital, USD	7.85 million
Area, square meters	67,400	Total assets, USD	84.02 million
International certification	ISO 9001, ISO 14001, ISO 45001	Revenue in 2020, USD	95.43 million

Source: CCM

5.1.2 Production of cyproconazole TC

In January 2021, Zhejiang Udragon announced that it would invest USD70.65 million (RMB450 million) in a technological reform project, which covers a total of 2,050 t/a existing pesticide technical production lines. And the capacity of cyproconazole technical increased from 50 t/a to 200 t/a.

In 2018–2020, Zhejiang Udragon's operating rate of cyproconazole technical was around 10%–20%. The product is generally produced when there is an order. In all pesticide products of Zhejiang Udragon, cyproconazole technical contributed about 0.70% to total sales value.

Table 5.1.2-1 Production situation of Zhejiang Udragon, 2018–H1 2021

Item	H1 2021	2020	2019	2018
Capacity, t/a	200	50	50	50
Output, tonne	10	10	5	5
Operating rate	10.00%	20.00%	10.00%	10.00%

Source: CCM

5.1.3 Export of cyproconazole TC

Zhejiang Udragon is mainly responsible for the production of pesticides, while its products are sold by its controlling shareholder Hangzhou Udragon. Its 95% cyproconazole technical products are mainly exported through other traders, and the trade usually takes place in April and May.

The export proportion of cyproconazole technical was 41% in 2020, and 60% in the first half of 2021.

Table 5.1.3-1 Export situation of Zhejiang Udragon's cyproconazole, 2018–Aug. 2021

Year	95% Tech.		
	Quantity (tonne)	Value (USD)	Unit price (USD/kg)
Jan.–Aug. 2021	6.000	322,540	53.76
2020	4.100	296,795	72.39
2019	0.000	/	/
2018	0.000	/	/

Source: Tranalysis

Table 5.1.3-2 Export destination of Zhejiang Udragon's cyproconazole, 2018–Aug. 2021

Year	Country/region	Quantity (tonne)			
		40% SC	95% Tech.	98% Tech.	100% AI volume
Jan.–Aug. 2021	Russia	0.000	6.000	0.000	5.700
2020	Russia	0.000	2.500	0.000	2.375
	Guatemala	0.000	1.600	0.000	1.520
2019	/	0.000	0.000	0.000	0.000
2018	/	0.000	0.000	0.000	0.000

Source: Tranalysis

Table 5.1.3-3 Export of Zhejiang Udragon's cyproconazole by channel, 2018–Aug. 2021

Year	Export by itself (tonne)				Export by other traders (tonne)			
	40% SC	95% Tech.	98% Tech.	100% AI volume	40% SC	95% Tech.	98% Tech.	100% AI volume
Jan.–Aug. 2021	0.000	0.000	0.000	0.000	0.000	6.000	0.000	5.700
2020	0.000	0.000	0.000	0.000	0.000	4.100	0.000	3.895
2019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Source: Tranalysis

5.1.4 Raw materials of cyproconazole TC

As for the Zhejiang Udragon's production of cyproconazole technical, it usually purchases PPT or cyproconazole technical directly from Jiangsu Province and Hubei Province.

5.1.5 Quotation (ex-works price) of cyproconazole TC

According to investigation, the ex-works price of Zhejiang Udragon's 95% cyproconazole technical was USD57.31/kg on 9 December, 2021.

5.2 Jiangsu Sword

5.2.1 Basic info

Address: No. 1008 Guanhuadong Road, Jianhu County, Yancheng City, Jiangsu Province, P. R. China

Tel: +86-515-86252139

Fax: +86-515-86252136

Person to contact: Manager Zhang

E-mail: sword@swordchem.com

Website: www.swordchem.com

Jiangsu Sword Agrochemicals Co., Ltd. (Jiangsu Sword), founded in 2001, is a private enterprise specialized in R&D, production and sales of low toxicity, high efficacy and low residue pesticide technical, formulations and intermediates.

The company is a state designated pesticide manufacturer and a national high-tech enterprise, currently holding 43 patents for invention. In recent years, the company has been selected as "Favorite pesticide brands in Chinese farmers" and "Top 100 pesticide enterprises in China" for several times.

Table 5.2.1-1 Company info of Jiangsu Sword, as of Dec. 2020

Time of establishment	2001	Enterprise type	private
Staff	700	Registered capital, USD	29.44 million
Area, square meters	65,565	Total assets, USD	220.24 million
International certification	ISO 9001, ISO 14001, ISO 45001	Revenue in 2020, USD	141.76 million

Source: CCM

5.2.2 Production of cyproconazole TC

Jiangsu Sword's 500 t/a cyproconazole production lines were completed in 2013. In 2018–2020, the operating rate of cyproconazole in Jiangsu Sword was around 10%–15%.

In 2020, cyproconazole products contributed about 3%–4% to the company's pesticide sales. And according to investigation, most of its cyproconazole technical products are sold in China, few going abroad. Basically, the company has inventory of cyproconazole technical in March and April.

Table 5.2.2-1 Production situation of Jiangsu Sword, 2018–H1 2021

Item	H1 2021	2020	2019	2018
Capacity, t/a	500	500	500	500
Output, tonne	80	70	50	50
Operating rate	32.00%	14.00%	10.00%	10.00%

Source: CCM

5.2.3 Export of cyproconazole TC

Jiangsu Sword exports 95% cyproconazole technical, basically by itself, but the export volume was small in recent years. The main export destination is Brazil.

The export proportion of cyproconazole technical in Jiangsu Sword was 2.90% in 2018, and 1.50% in the first half of 2021.

Table 5.2.3-1 Export situation of Jiangsu Sword's cyproconazole, 2018–Aug. 2021

Year	95% Tech.		
	Quantity (tonne)	Value (USD)	Unit price (USD/kg)
Jan.–Aug. 2021	12.000	548,674	45.72
2020	0.000	/	/
2019	0.000	/	/
2018	1.450	75,338	51.96

Source: Tranalysis

Table 5.2.3-2 Export destination of Jiangsu Sword's cyproconazole, 2018–Aug. 2021

Year	Country/region	Quantity (tonne)			
		40% SC	95% Tech.	98% Tech.	100% AI volume
Jan.–Aug. 2021	Brazil	0.000	12.000	0.000	11.400
2020	/	0.000	0.000	0.000	0.000
2019	/	0.000	0.000	0.000	0.000
2018	Belgium	0.000	1.450	0.000	1.378

Source: Tranalysis

Table 5.2.3-3 Export of Jiangsu Sword's cyproconazole by channel, 2018–Aug. 2021

Year	Export by itself (tonne)				Export by other traders (tonne)			
	40% SC	95% Tech.	98% Tech.	100% AI volume	40% SC	95% Tech.	98% Tech.	100% AI volume
Jan.–Aug. 2021	0.000	12.000	0.000	11.400	0.000	0.000	0.000	0.000
2020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2018	0.000	1.450	0.000	1.378	0.000	0.000	0.000	0.000

Source: Tranalysis

5.2.4 Raw materials of cyproconazole TC

Jiangsu Sword tries Grignard method to produce PPT; it also outsources PPT from Jiangsu Province. In addition, it is trying to develop new intermediates of PPT to improve the current problems of low purity and low yield.

5.2.5 Quotation (ex-works price) of cyproconazole TC

According to investigation, the ex-works price of Jiangsu Sword's 95% cyproconazole technical was USD59.66/kg on 20 December, 2021.

5.3 Jiangsu Sevencontinent

5.3.1 Basic info

Address: Dongsha Chemical Zone, Zhangjiagang City, Jiangsu Province, P. R. China
Tel: +86-512-58678398
Fax: +86-512-58608378
E-mail: info@sevencontinent.com
Website: www.sevencontinent.com

Founded in 1998, Jiangsu Sevencontinent Green Chemical Co., Ltd. (Jiangsu Sevencontinent), is a national high-tech enterprise specialized in R&D, production and sales of high efficacy, low toxicity, low residue and environmentally friendly pesticides. Jiangsu Sevencontinent has established a rather complete layout in pesticide business, with advanced testing, environmental protection facilities and equipment. Now it has large production bases in Zhangjiagang, Nanjing, Lianyungang and Honghu.

Jiangsu Sevencontinent has strong research and development strength, and has obtained more than 80 patents for invention by December 2021.

Table 5.3.1-1 Company info of Jiangsu Sevencontinent, as of Dec. 2020

Time of establishment	1998	Enterprise type	private
Staff	650	Registered capital, USD	8.01 million
Area, square meters	N/A	Total assets, USD	427.60 million
International certification	ISO 9001, ISO 14001, ISO 45001	Revenue in 2020, USD	353.83 million

Source: CCM

5.3.2 Production of cyproconazole TC

Jiangsu Chengyang is the main production base of cyproconazole. It completed the capacity expansion of cyproconazole from 200 t/a to 600 t/a in 2018, and began commissioning and production in October of the same year. The operating rate was nearly 65% in 2018 but it came down to slightly over 45% in 2020.

Both Jiangsu Fengdeng and Jiangsu Sevencontinent are shareholders of Jiangsu Chengyang, and they are jointly responsible for the sales of Jiangsu Chengyang's cyproconazole products. Cyproconazole sales accounted for 5%–6% of Jiangsu Sevencontinent's pesticide sales value in 2020.

Table 5.3.2-1 Production situation of Jiangsu Sevencontinent, 2018–H1 2021

Item	H1 2021	2020	2019	2018
Capacity, t/a	600	600	600	600
Output, tonne	170	280	210	380
Operating rate	56.67%	46.67%	35.00%	63.33%

Source: CCM

5.3.3 Export of cyproconazole TC

From 2018 to 2021, Jiangsu Sevencontinent exported cyproconazole products of 95% TC and 98% TC. Main export destinations are Russia, Paraguay, India, Argentina and Brazil. From 2018 to 2020, the company relied on other traders for 45%–65% of the exports.

From 2018 to the first half of 2021, its export proportion of cyproconazole technical was 88.89%, 67.72%, 72.30% and 56.39%, respectively.

Table 5.3.3-1 Export situation of Jiangsu Sevencontinent's cyproconazole, 2018–Aug. 2021

Year	40% SC			95% Tech.			98% Tech.		
	Quantity (tonne)	Value (USD)	Unit price (USD/kg)	Quantity (tonne)	Value (USD)	Unit price (USD/kg)	Quantity (tonne)	Value (USD)	Unit price (USD/kg)
Jan.–Aug. 2021	0	/	/	49.705	2,632,055	52.95	50.055	4,226,429	84.44
2020	0	/	/	184.900	11,121,003	60.15	17.000	1,029,250	60.54
2019	0	/	/	137.560	7,837,357	56.97	4.500	204,068	45.35
2018	15.552	231,414	14.88	292.885	15,161,433	51.77	43.525	2,324,441	53.40

Note: 40% SC is mainly exported by Jiangsu Fengdeng.

Source: Tranalysis

Table 5.3.3-2 Export destination of Jiangsu Sevencontinent's cyproconazole, 2018–Aug. 2021

Year	Country/region	Quantity (tonne)			
		40% SC	95% Tech.	98% Tech.	100% AI volume
Jan.–Aug. 2021	Brazil	0.000	0.000	50.005	49.005
	Russia	0.000	32.610	0.000	30.980
	India	0.000	7.295	0.000	6.930
	Argentina	0.000	5.100	0.000	4.845
	Vietnam	0.000	2.000	0.050	1.949
	Uzbekistan	0.000	1.050	0.000	0.998
	Turkey	0.000	0.850	0.000	0.808
	Paraguay	0.000	0.800	0.000	0.760
2020	Russia	0.000	73.900	17.000	86.865
	Paraguay	0.000	42.400	0.000	40.280
	India	0.000	34.275	0.000	32.561
	Ukraine	0.000	14.525	0.000	13.799
	Costa Rica	0.000	5.000	0.000	4.750
	Japan	0.000	4.200	0.000	3.990
	Uruguay	0.000	4.000	0.000	3.800
	Turkey	0.000	3.000	0.000	2.850
	Germany	0.000	2.000	0.000	1.900
	Mexico	0.000	1.000	0.000	0.950
	Vietnam	0.000	0.600	0.000	0.570
2019	India	0.000	36.000	0.000	34.200
	Argentina	0.000	27.250	0.000	25.888
	Paraguay	0.000	17.900	0.000	17.005

Year	Country/region	Quantity (tonne)			
		40% SC	95% Tech.	98% Tech.	100% AI volume
	Uruguay	0.000	11.000	3.000	13.390
	Japan	0.000	11.550	0.000	10.973
	Russia	0.000	6.400	0.000	6.080
	Uruguay	0.000	5.225	0.000	4.964
	Belgium	0.000	3.500	1.500	4.795
	New Zealand	0.000	5.000	0.000	4.750
	Ukraine	0.000	2.875	0.000	2.731
	Australia	0.000	2.600	0.000	2.470
	Costa Rica	0.000	2.000	0.000	1.900
	Guatemala	0.000	1.850	0.000	1.758
	Iran	0.000	1.500	0.000	1.425
	Belarus	0.000	1.400	0.000	1.330
	The Netherlands	0.000	0.500	0.000	0.475
	Latvia	0.000	0.500	0.000	0.475
	Vietnam	0.000	0.250	0.000	0.238
	South Africa	0.000	0.200	0.000	0.190
	Malaysia	0.000	0.050	0.000	0.048
	Brazil	0.000	0.010	0.000	0.010
2018	Paraguay	0.000	51.780	11.250	60.216
	India	0.000	63.000	0.000	59.850
	Argentina	15.552	38.825	0.000	43.105
	Russia	0.000	44.650	0.000	42.418
	Uruguay	0.000	30.500	8.000	36.815
	Germany	0.000	19.800	0.000	18.810
	Poland	0.000	7.000	8.575	15.054
	Japan	0.000	10.550	0.400	10.415
	Belgium	0.000	0.000	9.000	8.820
	New Zealand	0.000	7.000	0.000	6.650
	Hungary	0.000	0.000	6.300	6.174
	Ukraine	0.000	4.600	0.000	4.370
	Guatemala	0.000	3.650	0.000	3.468
	Lithuania	0.000	3.400	0.000	3.230

Year	Country/region	Quantity (tonne)			
		40% SC	95% Tech.	98% Tech.	100% AI volume
	Costa Rica	0.000	3.000	0.000	2.850
	Australia	0.000	2.400	0.000	2.280
	The Netherlands	0.000	1.000	0.000	0.950
	The UK	0.000	0.750	0.000	0.713
	Chile	0.000	0.400	0.000	0.380
	Iran	0.000	0.300	0.000	0.285
	Vietnam	0.000	0.200	0.000	0.190
	Jordan	0.000	0.075	0.000	0.071
	Brazil	0.000	0.005	0.000	0.005

Source: Tranalysis

Table 5.3.3-3 Export of Jiangsu Sevencontinent's cyproconazole by channel, 2018–Aug. 2021

Year	Export by itself (tonne)				Export by other traders (tonne)			
	40% SC	95% Tech.	98% Tech.	100% AI volume	40% SC	95% Tech.	98% Tech.	100% AI volume
Jan.–Aug. 2021	0.000	22.655	0.000	21.522	0.000	27.050	50.055	74.751
2020	0.000	79.500	12.000	87.285	0.000	105.400	5.000	105.030
2019	0.000	77.260	1.500	74.867	0.000	60.300	3.000	60.225
2018	0.000	89.130	26.275	110.423	15.552	203.755	17.250	216.693

Source: Tranalysis

5.3.4 Raw materials of cyproconazole TC

The major raw material for cyproconazole technical production in Jiangsu Sevencontinent is PPT, though it tries Darzen method to produce PPT starting from cyclopropyl methyl ketone. Most of the time, it still purchases PPT from outside.

5.3.5 Quotation (ex-works price) of cyproconazole TC

According to investigation, the ex-works price of Jiangsu Sevencontinent's 95% cyproconazole technical was USD56.52/kg on 20 December, 2021.

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