

Production and Export of Clethodim in China

The Seventh Edition

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Kcomber Inc.

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Executive summary

As of 18 Sept., 2023, there were 186 valid registrations of clethodim from 121 companies in China, including 26 for TC, 18 for TK, 113 for single formulations and 29 for mixed formulations, respectively.

In H1 2023, there were 12 clethodim technical producers in China and 8 of them were active. The capacity increased from 15,680 t/a in 2018 to 28,800 t/a in 2022, with a CAGR of 16.42%; meanwhile, the output reached 8,800 tonnes in H1 2023 and 18,900 tonnes in 2022, improving from that in 2018 (10,170 tonnes).

With unstably growing demand, the total export volume (converted into 100% AI) of clethodim technical and formulations in China went through ups and downs in 2020–H1 2023. China exported 17,458 tonnes of this product in 2022, yet it slipped largely in H1 2023, equating to only 24% of the 2022 total.

Introduction and methodology

Production and Export of Clethodim in China is CCM's report on production situation of clethodim industry in China finished in Oct. 2023. This intelligent report attaches importance to following parts:

- Registration of clethodim (including technical and formulations) in China;
- Production (capacity & output) and producers of clethodim in China, 2018–H1 2023;
- Export of clethodim in China by volume and price, 2018–H1 2023.

The report is drafted by diverse methods as follows:

- Desk research

The sources of desk research are various, including published magazines, journals, government statistics, industrial statistics, customs statistics, association seminars as well as information from the Internet.

- Internet

CCM 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
- China Customs
- 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.

- Abbreviation

- CAGR: Compound annual growth rate
- TC: Technical material
- TK: Technical concentrate
- ME: Micro emulsion
- EC: Emulsifiable concentrate
- OD: Oil dispersion

- Unit

- t: tonne
- t/a: tonne/annual
- USD: currency unit in the US
- RMB: currency unit in China, also named yuan
- tonne: equals to metric ton in this report

Table 1-1 USD/RMB exchange rate, Jan. 2016–Sept., 2023

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	6.6401
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	6.468	6.4604	6.4192	6.3693	6.4615
2022	6.3794	6.3580	6.3014	6.3509	6.5672	6.6651	6.6863	6.7467	6.8821	7.0992	7.2081	7.1225	6.6972
2023	6.9475	6.7492	6.9400	6.8805	6.9054	7.0965	7.2157	7.1283	7.1788	-	-	-	7.0047

Source: The People's Bank of China

1 Registration of clethodim in China

As of 18 Sept., 2023, there are 186 valid registrations of clethodim from 121 companies in China, including 157 for single formulations and 29 for mixed formulations, according to the Institute for the Control of Agrochemicals, Ministry of Agriculture and Rural Affairs (ICAMA). Among them, 26 are for TC and 18 are for TK (with one for export only). Generally, clethodim formulations are applied to fields of soybean, rapeseed, tobacco, potato, mung bean and red bean against gramineous weeds.

As for the types of clethodim formulations, only three (EC, OD and ME) have been registered. Among the registrations of clethodim's single formulations in China, 112 were for EC and only 1 was for OD. In terms of mixed formulations, 19 registrations were for OD, 9 for EC and 1 for ME.

Table 1-1 Registrations of clethodim technical in China, as of 18 Sept., 2023

No.	Registrant	Registration number	Type of formulation	Content	Expiry date
1	Jiangsu Yunfan Chemical Co., Ltd.	PD20220428	TK	70%	2027/12/29
2	Jiangsu Yunfan Chemical Co., Ltd.	EX20220172	TK	50%	2027/10/08
3	Hebei Lansheng Biotech Co., Ltd.	PD20200395	TK	37%	2025/06/08
4	Ningxia Gerui Fine Chemical Co., Ltd.	PD20171961	TC	94%	2027/09/18
5	Shandong Binnong Technology Co., Ltd.	PD20171869	TC	95%	2027/09/18
6	Sevencontinent Green Chemical (Jining) Co., Ltd.	PD20171250	TK	37%	2027/07/18
7	Liaoning Cynda Chemical Co., Ltd.	PD20171163	TK	70%	2027/07/18
8	Hebei Lansheng Biotech Co., Ltd.	PD20171148	TC	95%	2027/07/18
9	Shenyang Sciencreat Chemicals Co., Ltd.	PD20170685	TK	70%	2027/04/09
10	Shandong Cynda Chemical Co., Ltd.	PD20170031	TK	37%	2027/01/07
11	Shandong Weifang Rainbow Chemical Co., Ltd.	PD20161273	TK	37%	2026/10/14
12	Hengshui Jingmei Chemical Co., Ltd.	PD20161059	TK	37%	2026/08/30
13	Wuwei lianshuo Biotechnology Co., Ltd.	PD20160452	TK	37%	2026/03/16
14	Shandong Weifang Rainbow Chemical Co., Ltd.	PD20152532	TC	94%	2025/12/17
15	Hunan Bide Biotechnology Co., Ltd.	PD20151702	TC	94%	2025/08/28
16	Shanxi Lvhai Pesticide Science and Technology Co., Ltd.	PD20151560	TC	95%	2025/08/03
17	Shoujian Technology Co., Ltd.	PD20151290	TC	95%	2025/07/30
18	Jiangxi Heyi Chemical Co., Ltd.	PD20151148	TK	37%	2025/06/26
19	Jiangxi Heyi Chemical Co., Ltd.	PD20151057	TK	70%	2025/06/14
20	Jiangsu Yunfan Chemical Co., Ltd.	PD20150784	TK	37%	2025/05/13
21	Jiangsu Yunfan Chemical Co., Ltd.	PD20142210	TC	94%	2024/09/28

No.	Registrant	Registration number	Type of formulation	Content	Expiry date
22	Ningxia Gerui Fine Chemical Co., Ltd.	PD20142204	TC	95%	2024/09/29
23	Jiangxi Heyi Chemical Co., Ltd.	PD20141071	TC	95%	2024/04/25
24	Zhejiang Heben Pesticide & Chemicals Co., Ltd.	PD20140982	TC	94%	2024/04/14
25	Liaoning Cynda Chemical Co., Ltd.	PD20122114	TK	37%	2027/12/25
26	Shandong Cynda Chemical Co., Ltd.	PD20120967	TC	90%	2027/06/14
27	Wuwei lianshuo Biotechnology Co., Ltd.	PD20120722	TC	90%	2027/04/27
28	ADAMA Huifeng (Jiangsu) Ltd.	PD20120328	TK	37%	2027/02/17
29	Changqing (Hubei) Bio-tech Co., Ltd.	PD20110444	TK	70%	2026/04/21
30	Hengshui Jingmei Chemical Co., Ltd.	PD20110340	TC	95%	2026/03/24
31	Shenyang Sciencreat Chemicals Co., Ltd.	PD20110326	TK	37%	2026/03/24
32	ADAMA Huifeng (Jiangsu) Ltd.	PD20102077	TC	95%	2025/11/03
33	Jiangsu Flag Chemical Industry Co., Ltd.	PD20096795	TC	90%	2024/09/15
34	Hebei Wanquan Hongyu Chemical Co., Ltd.	PD20096012	TC	90%	2024/06/12
35	Hebei Lanrun Plant Protection Technology Co., Ltd.	PD20094828	TC	90%	2024/04/13
36	Ningxia Yifan Biotechnology Co., Ltd.	PD20093488	TC	94%	2024/03/23
37	Jiangsu Agrochem Laboratory Co., Ltd.	PD20092487	TC	90%	2024/02/26
38	Jiangsu Changqing Agrochemical Co., Ltd.	PD20086078	TC	93%	2023/12/30
39	Shaoxing Shangyu Xinyinbang Biochemical Co., Ltd.	PD20082747	TC	90%	2028/12/07
40	Jiangsu Sevencontinent Green Chemical Co., Ltd.	PD20082579	TC	95%	2028/12/03
41	Hebei Wanquan Lihua Chemicals Co., Ltd.	PD20080653	TC	90%	2028/05/26
42	Hebei Wanquan Lihua Chemicals Co., Ltd.	PD20080651	TK	70%	2028/05/26
43	Liaoning Cynda Chemical Co., Ltd.	PD20070066	TC	90%	2027/03/20
44	Shenyang Sciencreat Chemicals Co., Ltd.	PD20070065	TC	94%	2027/03/20

Note: Capital Industry Construction Technology Co., Ltd. previously known as Shoujian Technology Co., Ltd.
Source: Institute for the Control of Agrochemicals, Ministry of Agriculture and Rural Affairs (ICAMA)

Table 1-2 Registrations of clethodim formulations in China, as of 18 Sept., 2023

Formulation		Active ingredient	Content	Number	Share
Single formulations	EC	Clethodim	240g/L	52	46%
		Clethodim	120g/L	31	27%
		Clethodim	24%	15	13%
		Clethodim	30%	6	5%
		Clethodim	35%	3	3%
		Clethodim	26%	1	1%
		Clethodim	13%	1	1%
		Clethodim	12%	1	1%
		Clethodim	480g/L	1	1%
		Clethodim	360g/L	1	1%
	OD	Clethodim	12%	1	1%
Sub-total		/		113	100%
Mixed formulations	OD	Fomesafen-Clethodim	21% & 28%	6	21%
		Clomazone-Fomesafen-Clethodim	37%	4	14%
		Metribuzin-Clethodim-Rimsulfuron	28%, 25% & 22%	3	10%
		Clopyralid-Picloram-Clethodim	20%	2	7%
		Clopyralid-Clethodim	8%	1	3%
		Clopyralid-Clethodim-Benazolin-ethyl	16%	1	3%
		Clethodim-Glufosinate-ammonium	20%	1	3%
		Clethodim-Rimsulfuron	15%	1	3%
	EC	Clomazone-Fomesafen-Clethodim	39%, 32% & 22%	5	17%
		Clethodim-Haloxyfop-P-methyl	23% & 22.5%	2	7%
		Fomesafen-Clethodim	25%	1	3%
		Clethodim-Benazolin-ethyl	12%	1	3%
	ME	Fomesafen-Clethodim	30%	1	3%
	Sub-total		/		29

Source: ICAMA

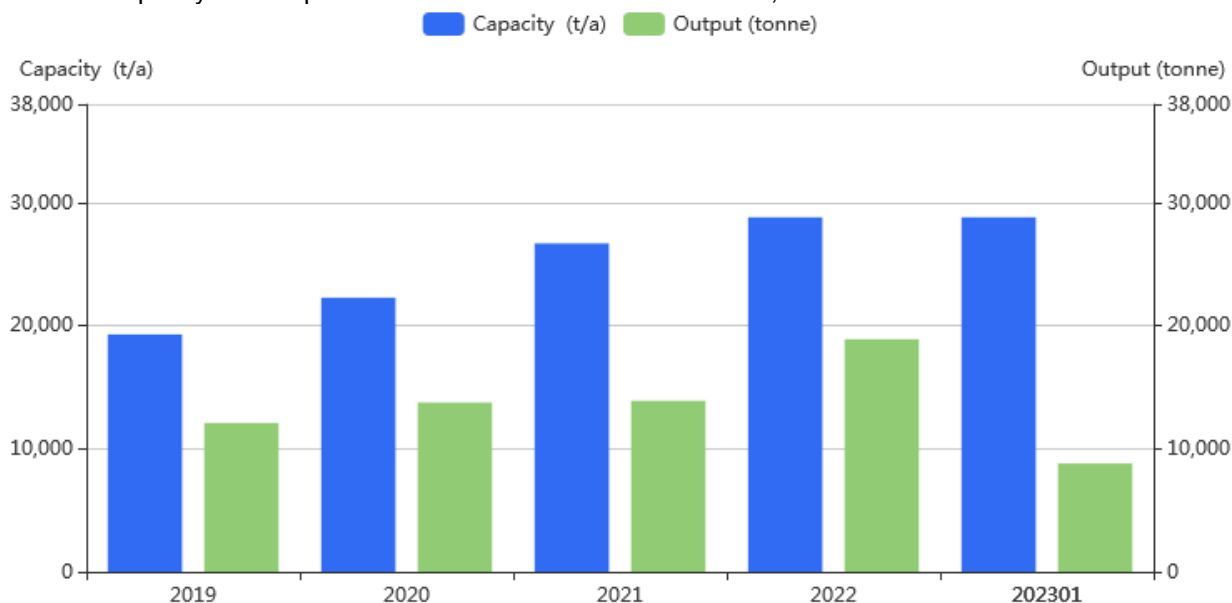
2 Supply of clethodim in China, 2018–H1 2023

2.1 Overview of production

On the whole, the production capacity and output of clethodim technical in China maintain an uptrend from 2018 to 2022, yet being stable in H1 2023. The capacity increases from 15,680 t/a in 2018 to 28,800 t/a in 2022, with a CAGR of 16.42%, while the output increases from 10,170 tonnes in 2018 to 18,900 tonnes in 2022, with a CAGR of 16.76%.

In the first half of 2023, there was no new capacity of clethodim technical in China. The existing producers reduced their operation rates and the output fell to 8,800 tonnes in H1 2023.

Figure 2.1-1 Capacity and output of 90% clethodim technical in China, 2019–H1 2023



Note: 202301 refers to the first half of 2023.

Source: CCM

2.2 Producer

In H1 2023, there were 12 clethodim technical producers in China, 8 of which were active.

Hebei Lansheng Biotech Co., Ltd.

On 8 Jan., 2022, Hebei Lansheng Biotech Co., Ltd. (Hebei Lansheng)'s 4,000 t/a clethodim technical project completed construction and entered operation. In July 2023, Hebei Lansheng's environmental impact assessment on the expansion project of 25,005 t/a efficient and low-toxic pesticides was approved by the local government, including the expansion of clethodim TC capacity from 4,000 t/a to 12,000 t/a.

Shandong Cynda Chemical Co., Ltd.

Since the operation of its wholly-owned subsidiary Liaoning Cynda Chemical Co., Ltd.'s new clethodim technical production lines (8,000 t/a) in H1 2022, Shandong Cynda Chemical Co., Ltd. (Shandong Cynda) has become the largest clethodim producer in China, with a total capacity of 12,100 t/a clethodim technical.

Ningxia Gerui Biotechnology Co., Ltd.

On 8 June, 2021, Ningxia Gerui Biotechnology Co., Ltd. (Ningxia Gerui), the wholly-owned subsidiary of Shandong Weifang Rainbow Chemical Co., Ltd., passed the completion acceptance for 500 t/a clethodim technical.

Hebei Wuqiao Pesticide Co., Ltd.

Hebei Wuqiao Pesticide Co., Ltd. transferred 90% TC qualification to its subsidiary, Wuwei Lianshuo Biotechnology Co., Ltd. which now has 2,000 t/a clethodim technical capacity in operation since April 2021.

Table 2.2-1 Capacity and output of clethodim technical in China, 2019–H1 2023, t/a

No.	Company	Status, as of June, 2023	H1 2023		2022		2021		2020		2019	
			Capacity	Output	Capacity	Output	Capacity	Output	Capacity	Output	Capacity	Output
1	Liaoning Cynda Chemical Co., Ltd.	Active	8,000	1,500	8,000	4,800	3,000	1,700	/	/	/	/
2	Yifan Biotechnology Group Co., Ltd.	Active	6,000	3,000	6,000	4,700	6,000	4,600	6,000	3,500	3,000	3,000
3	Shandong Cynda Chemical Co., Ltd.	Active	4,100	1,000	4,100	3,800	4,100	3,800	4,100	4,000	4,100	3,200
4	Hebei Lansheng Biotech Co., Ltd.	Active	4,000	1,000	4,000	1,500	/	/	/	/	/	/
5	Cangzhou Green Chemical Co., Ltd.	Active	3,000	800	3,000	1,500	3,000	1,400	3,000	1,500	3,000	1,450
6	Wuwei Lianshuo Biotechnology Co., Ltd.	Active	2,000	500	2,000	950	2,000	1,000	1,000	950	1,000	1,000
7	Shenyang Sciencreat Chemicals Co., Ltd.	Active	1,200	750	1,200	1,200	1,200	700	1,600	1,200	1,600	1,000
8	Ningxia Gerui Biotechnology Co., Ltd.	Active	500	250	500	450	500	350	/	/	/	/
Total			28,800	8,800	28,800	18,900	26,680	13,900	22,280	13,750	19,280	12,100

Source: CCM

- Status of planned capacities as of Sept., 2023:

- On 1 Aug., Inner Mongolia Miraculous Crop Science Co., Ltd., the wholly-owned subsidiary of Lianyungang Liben crop science and Technology Co., Ltd. filed its 30,000 t/a clethodim TC & TK project and the 80,000 t/a mancozeb technical project on the local government website.
- In August, Hebei Nongbiwei Biotechnology Co., Ltd.'s 33,100 t/a green pesticide technicals and byproducts project was publicised in the government website, including 6,300 t/a clethodim TC & TK.
- On 17 July, Ningxia Hanrun Biotechnology Co., Ltd., the wholly-owned subsidiary of Shandong Weifang Rainbow Chemical Co., Ltd., launched for the constuction of 8,000 t/a clethodim project upon the completion of R&D Building, with the investment totalling USD110.04 million (RMB790 million).
- On 26 May, Jiangsu Corechem Co., Ltd. announced its 12,000 t/a formulation project has the Phase I came into production; with environmental impact assessment approved, the Phase II of 7,400 t/a pesticide technicals was in progress, including 1,000 t/a clethodim technical.
- On 25 April, Shandong Cynda Chemical Co., Ltd. announced its plan to build 5,000 t/a clethodim TC & TK with the investment of USD9.14 million (RMB65.6 million).
- In Feb., the EIA document of the pesticide project of Liaoning Youchuang Plant Protection Co. Ltd., the wholly-owned subsidiary of Jiangsu Yangnong Chemical Co., Ltd., was publicised for the second public notice, which is to build capacity of 15,650 t/a pesticide technical and 7,000 t/a intermediates, including 5,000 t/a clethodim technical.

Table 2.2-2 Potential capacity of clethodim technical in China as of Sept., 2023

No.	Producer	Project location	Planned capacity, t/a	Remark
1	Inner Mongolia Miraculous Crop Science Co., Ltd.	Inner Mongolia Autonomous Region	30,000	Under environmental impact assessment
2	Hebei Nongbiwei Biotechnology Co., Ltd.	Hebei Province	6,300	Environmental impact assessment approved
3	Hebei Lansheng Biotech Co., Ltd.	Hebei Province	8,000	Under environmental impact assessment
4	Ningxia Hanrun Biotechnology Co., Ltd.	Ningxia Province	8,000	Under construction
5	Jiangsu Corechem Co., Ltd.	Jiangsu Province	1,000	Environmental impact assessment approved
6	Liaoning Youchuang Plant Protection Co., Ltd.	Liaoning Province	5,000	Under environmental impact assessment
7	Shandong Cynda Chemical Co., Ltd.	Shandong Province	5,000	Planning

Source: CCM

3 Export of clethodim in China, 2018–H1 2023

3.1 Export situation

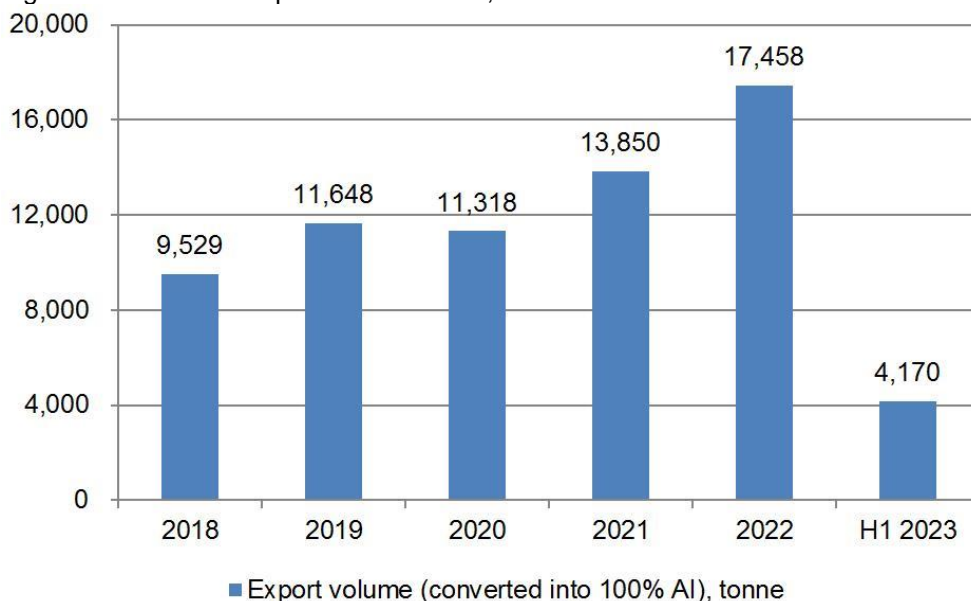
With unstable growing demand, the total export volume (converted into 100% AI) of clethodim technical and formulations in China went through ups and downs. In 2020–2022, China's clethodim exports registered increases, yet the export volume in H1 2023 was 4,170 tonnes, equating to merely 23.89% of the 2022 total (=17,458 tonnes).

In 2022, China's major export-oriented clethodim products were 37% TK and 94% TC. Of those, the volume (in real terms) of 37% TK and 94% TC accounted for 30.35% and 58.32% of all China's exports for clethodim technical, respectively. While the types of exported clethodim formulations were 240g/L EC, 120g/L EC and 360g/L EC; the 240g/L EC accounted for 98.02% of all export volume for clethodim formulations in 2022.

In 2022, China's clethodim were exported to at least 30 countries and regions. The top five export destinations by volume were Argentina, the US, Brazil, Russia and India in the year, accounting for 95.48% of China's total clethodim export volume (100% AI volume).

In 2022, a total of 103 companies took part in the clethodim export business in China. The top four exporters by volume (100% AI volume) were Jiangsu Yunfan Chemical Co., Ltd., Shandong Cynda Chemical Co., Ltd. (together with its subsidiary Liaoning Cynda Chemical Co., Ltd.), ADAMA Ltd. (including Adama Anpon (Jiangsu) Ltd. and Adama Shanghai Trading Co., Ltd.) and Shandong Weifang Rainbow Chemical Co., Ltd., respectively.

Figure 3.1-1 China's exports of clethodim, 2018–H1 2023



Source: *Tranalysis*

- By month

Table 3.1-1 China's exports of clethodim by month, H1 2023

Month	Formulation						Technical												Total (100% AI clethodim), tonne
	120g/L EC		240g/L EC		360g/L EC		37% TK		50% TK		90% TC		93% TC		94% TC		95% TC		
	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
Jan.	0.000	/	950.732	7.27	0.000	/	46.000	9.32	0.000	/	16.000	16.98	24.000	21.64	349.063	20.73	0.000	/	619.542
Feb.	310.624	8.68	398.587	6.70	115.370	8.66	1,732.060	7.27	0.000	/	29.180	17.27	0.000	/	391.000	21.85	20.000	19.74	1,232.119
March	348.856	10.99	1,078.998	7.95	44.010	10.13	80.000	6.65	0.000	/	0.000	/	18.000	21.36	263.930	20.80	24.000	25.58	644.690
April	76.906	11.07	903.503	7.11	86.281	9.19	6.000	9.35	0.000	/	0.000	/	29.000	13.90	465.000	15.53	24.000	16.00	755.256
May	17.580	12.04	135.861	7.86	17.668	6.07	289.000	9.03	54.000	7.40	0.000	/	5.000	26.80	388.000	14.04	143.000	/	681.585
June	10.512	13.48	17.513	8.06	0.000	/	0.000	/	16.000	7.57	0.000	/	22.000	21.50	216.000	9.85	0.000	/	237.140
Total	764.478	10.12	3,485.194	7.40	263.328	8.90	2,153.060	7.53	70.000	7.44	45.180	17.16	98.000	19.53	2,072.993	17.40	211.000	20.48	4,170.332

Source: Tranalysis

Table 3.1-2 China's exports of clethodim by month, 2022

Month	Formulation						Technical														Total (100% AI clethodim), tonne
	120g/L EC		240g/L EC		360g/L EC		37% TK		50% TK		70% TK		90% TC		93% TC		94% TC		95% TC		
	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
Jan.	0.000	/	2,499.090	7.60	41.042	12.02	901.016	7.34	0.000	/	0.000	/	134.600	26.82	0.000	/	387.836	30.75	48.334	28.60	1,504.546
Feb.	7.000	6.00	1,735.921	8.00	0.000	/	570.271	8.16	0.000	/	0.000	/	73.000	28.39	143.000	28.46	897.989	27.27	44.245	23.70	1,730.653
March	0.000	/	1,304.083	9.45	0.000	/	190.440	7.88	0.000	/	0.000	/	20.000	32.62	124.000	17.18	429.672	26.84	20.000	34.31	952.695
April	5.116	7.41	970.696	9.41	144.000	13.25	0.000	/	0.000	/	0.000	/	0.000	/	25.000	27.24	460.334	25.57	77.000	31.68	824.242
May	0.000	/	2,068.903	9.72	0.812	11.82	222.872	7.90	0.000	/	2.916	11.28	0.000	/	50.000	27.04	788.000	23.31	75.000	23.92	1,460.492
June	9.739	6.21	1,451.882	7.83	48.000	10.75	664.306	7.91	0.000	/	168.000	16.49	0.000	/	0.000	/	1,199.002	22.68	0.000	/	1,871.874
July	21.000	4.45	2,642.728	7.37	83.800	10.64	499.014	8.19	0.000	/	0.000	/	0.000	/	75.000	15.50	1,062.000	21.69	0.000	/	1,946.035
Aug.	0.000	/	3,227.568	7.27	28.640	10.80	150.256	8.95	0.000	/	0.000	/	0.000	/	100.000	15.50	766.314	22.41	0.000	/	1,686.132
Sept.	0.000	/	1,288.218	7.32	20.000	10.92	447.628	7.94	112.000	11.31	0.000	/	0.000	/	56.000	18.90	1,447.900	21.85	0.000	/	1,963.983
Oct.	0.000	/	1,288.382	7.59	2.000	11.72	377.091	7.98	0.000	/	0.000	/	32.000	20.47	0.000	/	1,623.424	22.77	0.000	/	2,017.158
Nov.	0.000	/	1,364.082	7.31	0.000	/	556.114	8.08	40.600	11.70	0.000	/	144.720	20.52	49.200	22.06	299.650	22.44	24.000	21.98	1,047.558
Dec.	0.000	/	845.803	7.20	5.744	9.02	292.594	8.10	89.000	11.35	0.000	/	16.000	22.10	52.000	20.78	0.000	/	24.600	20.25	452.408
Total	42.855	5.46	20,687.354	7.93	374.038	11.82	4,871.601	7.93	241.600	11.39	170.916	16.40	420.320	24.54	674.200	21.02	9,362.121	23.59	313.179	26.74	17,457.776

Source: Tranalysis

Table 3.1-3 China's exports of clethodim by month, 2021

Month	Formulation						Technical												Total (100% AI clethodim), tonne
	120g/L EC		240g/L EC		360g/L EC		37% TK		70% TK		90% TC		93% TC		94% TC		95% TC		
	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
Jan.	170.310	2.92	1,302.345	5.60	0.000	/	669.676	8.55	0.000	/	30.000	15.41	0.010	60.00	156.004	13.65	0.000	/	767.457
Feb.	99.940	3.82	821.463	5.95	0.000	/	952.200	5.49	24.010	9.91	0.000	/	0.000	/	118.000	15.95	67.655	15.65	761.672
March	105.840	3.82	2,224.747	6.17	0.000	/	908.620	6.18	0.000	/	18.000	13.75	0.000	/	200.000	15.67	84.600	15.51	1,189.647
April	1.620	5.73	2,387.285	7.31	0.000	/	587.338	7.44	0.000	/	0.200	18.00	0.000	/	322.932	14.65	95.009	18.70	1,208.325
May	1.620	6.14	3,403.554	8.66	0.000	/	63.000	6.45	0.000	/	0.000	/	100.000	14.00	715.075	12.72	20.400	28.80	1,658.943
June	320.219	5.10	2,468.293	6.84	46.000	7.20	881.704	7.94	0.000	/	0.000	/	128.000	14.23	842.616	15.20	39.000	28.69	1,946.439
July	76.564	5.12	2,086.688	5.42	21.600	8.03	742.960	6.52	0.000	/	0.000	/	24.010	13.96	274.327	15.30	20.000	28.80	1,112.728
Aug.	54.788	5.73	2,791.136	5.04	21.600	8.30	647.515	7.39	0.000	/	0.000	/	0.000	/	687.800	15.38	46.000	28.31	1,641.947
Sept.	691.016	4.95	589.055	7.55	40.220	8.44	417.540	6.69	0.000	/	0.000	/	22.000	31.50	219.920	18.58	0.000	/	626.339
Oct.	37.152	4.85	1,475.999	5.68	72.252	8.84	189.174	6.89	0.000	/	0.000	/	0.000	/	474.060	16.11	22.000	28.81	935.979
Nov.	90.760	6.06	479.073	5.79	49.446	21.52	397.106	7.22	0.000	/	0.000	/	12.000	28.25	573.935	17.67	164.000	28.14	1,001.848
Dec.	72.572	8.52	628.272	7.23	16.000	10.72	872.477	7.22	0.000	/	0.000	/	0.000	/	428.091	30.21	107.000	33.96	998.408
Total	1,722.401	4.88	20,657.909	6.55	267.118	10.85	7,329.310	6.99	24.010	9.91	48.200	14.80	286.020	16.04	5,012.760	16.63	665.664	24.96	13,849.733

Source: Tranalysis

Table 3.1-4 China's exports of clethodim by month, 2020

Month	Formulation				Technical										Total (100% AI clethodim), tonne
	120g/L EC		240g/L EC		37% TK		90% Tech.		93% Tech.		94% Tech.		95% Tech.		
	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
Jan.	300.591	4.69	1,554.282	7.09	946.400	7.40	42.000	18.14	0.000	/	245.200	16.84	0.000	/	1,043.097
Feb.	41.732	5.48	225.011	6.97	273.000	7.27	0.000	/	0.000	/	50.000	16.28	0.000	/	209.271
March	141.415	2.41	2,713.501	6.91	635.610	7.43	87.020	14.19	0.000	/	277.750	16.62	0.000	/	1,269.924
April	70.775	4.74	2,748.702	6.64	1,063.730	7.31	0.000	/	0.000	/	96.000	17.02	0.000	/	1,179.489
May	0.808	6.30	2,227.316	7.24	748.800	7.87	0.000	/	0.000	/	396.000	18.05	0.000	/	1,206.222
June	0.000	/	2,222.244	7.35	566.000	7.74	0.000	/	48.000	18.35	660.400	17.92	12.000	19.95	1,441.797
July	30.348	4.21	1,898.450	6.74	179.220	7.75	66.000	17.28	46.000	23.26	663.000	18.53	0.000	/	1,269.966
Aug.	0.000	/	1,756.934	7.14	592.000	6.63	96.000	15.59	24.000	17.17	249.000	18.75	0.000	/	1,001.054
Sept.	0.000	/	1,657.791	6.53	206.000	3.63	24.000	14.35	24.000	16.08	359.000	18.23	0.000	/	872.048
Oct.	1.028	3.19	1,116.386	6.56	583.378	0.49	110.000	15.44	0.000	/	200.000	15.64	0.002	20.00	782.072
Nov.	2.749	4.65	623.232	3.02	608.954	0.44	84.000	12.58	25.000	13.00	172.800	17.60	0.000	/	642.733
Dec.	0.000	/	695.384	3.07	611.422	0.00	0.000	/	0.000	/	0.000	/	0.000	/	400.072
Total	589.447	4.18	19,439.234	6.66	7,014.514	5.47	509.020	15.19	167.000	18.40	3,369.150	17.76	12.002	19.95	11,317.743

Note: "37% TK" refers to as "37% TKL" in previous Production and Export of Clethodim Issues.

Source: Tranalysis

Table 3.1-5 China's exports of clethodim by month, 2019

Month	Formulation				Technical												Total (100% AI clethodim), tonne
	120g/L EC		240g/L EC		37% TK		70% TK		90% Tech.		93% Tech.		94% Tech.		95% Tech.		
	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
Jan.	144.255	5.55	1,325.522	8.76	1,477.425	12.64	82.000	20.08	60.000	26.37	0.000	/	134.400	18.82	0.000	/	1,133.074
Feb.	1.410	6.88	1,181.932	9.29	921.820	11.81	32.000	15.67	7.000	27.15	0.000	/	67.600	22.23	0.000	/	728.970
March	67.960	5.00	1,350.532	9.21	1,168.020	10.05	0.000	/	0.000	/	0.000	/	140.800	20.80	0.000	/	910.308
April	4.650	5.50	1,247.790	9.03	1,403.277	9.91	0.000	/	0.000	/	0.000	/	115.400	21.98	0.000	/	940.194
May	0.000	/	3,229.784	8.04	1,046.000	9.74	0.000	/	0.000	/	0.000	/	104.800	22.57	0.000	/	1,292.978
June	8.604	5.31	3,038.788	7.91	500.640	9.86	0.000	/	0.000	/	0.000	/	157.990	23.36	0.000	/	1,094.477
July	0.940	5.00	3,360.765	8.04	432.000	9.67	0.000	/	12.000	23.16	0.000	/	119.000	22.98	37.000	21.74	1,157.954
Aug.	2.000	4.98	1,963.830	8.14	510.750	9.99	0.000	/	12.000	23.71	12.000	24.10	285.800	21.49	12.000	23.81	982.187
Sept.	13.730	5.45	1,697.698	8.29	153.434	10.41	0.000	/	101.000	23.27	0.000	/	266.000	20.00	19.400	22.36	842.213
Oct.	19.400	5.04	2,214.701	8.35	199.000	9.76	0.000	/	0.000	/	0.000	/	163.400	23.73	0.000	/	783.229
Nov.	10.000	4.74	814.763	9.13	1,048.000	9.80	0.000	/	43.400	18.49	56.000	20.19	503.000	17.89	10.000	21.39	1,166.111
Dec.	50.640	5.28	665.733	7.75	523.420	10.84	0.600	11.28	35.000	18.27	0.000	/	194.400	18.05	37.800	20.49	616.741
Total	323.589	5.32	22,091.838	8.35	9,383.786	10.56	114.600	18.80	270.400	22.66	68.000	20.88	2,252.590	20.48	116.200	21.62	11,648.436

Source: Tranalysis

Table 3.1-6 China's exports of clethodim by month, 2018

Month	Formulation				Technical										Total (100% AI clethodim), tonne
	120g/L EC		240g/L EC		37% TK		70% TK		90% Tech.		94% Tech.		95% Tech.		
	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
Jan.	62.736	5.25	1,629.196	8.80	1,435.400	10.17	91.000	18.58	67.600	25.80	75.000	26.32	0.000	/	1,140.965
Feb.	26.455	5.61	1,287.319	8.63	699.500	9.96	16.000	15.92	16.000	28.85	33.600	25.35	0.200	16.03	641.193
March	7.717	5.22	429.260	9.32	961.840	10.28	0.000	/	103.400	21.53	36.200	22.05	0.000	/	591.210
April	13.580	4.38	1,161.889	9.20	828.640	9.93	0.000	/	4.000	23.05	0.000	/	0.000	/	602.299
May	9.750	3.09	2,225.846	8.21	1,439.000	9.34	0.000	/	0.000	/	32.000	22.63	0.000	/	1,120.142
June	6.512	3.92	2,203.044	7.73	464.000	9.20	0.000	/	0.000	/	51.000	22.38	0.000	/	771.162
July	0.000	/	1,751.103	7.56	256.600	8.99	0.000	/	80.800	22.56	12.110	28.91	0.000	/	616.821
Aug.	5.452	5.09	1,945.825	7.65	126.000	9.39	0.000	/	75.200	25.26	0.000	/	0.100	25.99	601.506
Sept.	0.000	/	1,719.413	7.99	414.000	9.23	0.000	/	41.200	21.96	33.600	16.38	0.000	/	651.697
Oct.	4.650	4.80	1,140.440	8.18	893.500	11.41	0.000	/	24.000	24.61	92.000	16.52	0.000	/	724.343
Nov.	0.000	/	820.686	9.12	2,142.208	11.22	0.000	/	43.800	25.10	117.600	17.11	0.000	/	1,147.752
Dec.	4.650	5.49	972.103	8.72	1,347.200	11.80	64.000	15.66	56.000	25.81	68.600	19.49	19.000	25.38	919.782
Total	141.502	5.01	17,286.124	8.25	11,007.888	10.43	171.000	17.24	512.000	24.00	551.710	20.40	19.300	25.29	9,528.872

Source: Tranalysis

- By destination

Table 3.1-7 China's exports of clethodim by destination, H1 2023

No.	Country	Formulation						Technical												Total (100% AI clethodim), tonne
		120g/L EC		240g/L EC		360g/L EC		37% TK		50% TK		90% TC		93% TC		94% TC		95% TC		
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
1	Argentina	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	48.000	17.57	1,265.000	18.94	24.000	25.58	1,256.540
2	Paraguay	0.000	/	14.600	6.61	24.526	6.06	1,834.000	7.36	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	691.059
3	The US	0.000	/	1,325.063	7.23	0.000	/	53.805	7.77	0.000	/	0.000	/	0.000	/	191.498	22.61	0.000	/	531.182
4	Russia	374.976	8.96	401.357	6.57	0.000	/	172.000	8.27	70.000	7.44	45.180	17.16	40.000	21.44	0.020	20.25	138.000	/	452.957
5	India	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	456.000	10.84	0.000	/	428.640
6	Brazil	0.000	/	866.124	7.68	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	216.531
7	Australia	0.000	/	21.272	6.70	139.220	8.67	87.255	9.39	0.000	/	0.000	/	0.000	/	95.475	17.92	0.000	/	177.468
8	Kazakhstan	305.706	12.81	263.941	8.66	30.694	10.67	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	113.720
9	Chile	0.000	/	182.488	7.21	68.889	9.61	6.000	9.35	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	72.642
10	Turkey	0.000	/	19.200	11.00	0.000	/	0.000	/	0.000	/	0.000	/	10.000	21.33	8.000	18.25	44.000	17.70	63.420
11	France	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	52.000	17.53	0.000	/	48.880
12	Malaysia	0.000	/	67.240	7.39	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	16.810
13	Mexico	0.000	/	46.425	8.93	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	5.000	/	16.356
14	Colombia	0.000	/	55.153	7.29	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	13.788

No.	Country	Formulation						Technical												Total (100% AI clethodim), tonne		
		120g/L EC		240g/L EC		360g/L EC		37% TK		50% TK		90% TC		93% TC		94% TC		95% TC				
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg		Volume, tonne	Price, USD/kg
15	Thailand	0.000	/	41.196	6.86	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	10.299
	Others	83.796	5.49	181.135	7.04	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	5.000	13.23	0.000	/			60.039
	Total	764.478	10.12	3,485.194	7.40	263.328	8.90	2,153.060	7.53	70.000	7.44	45.180	17.16	98.000	19.53	2,072.993	17.40	211.000	20.48			4,170.332

Source: Tranalysis

Table 3.1-8 China's exports of clethodim by destination, 2022

No.	Country	Formulation						Technical												Total (100% AI clethodim), tonne		
		120g/L EC		240g/L EC		360g/L EC		37% TK		50% TK		70% TK		90% TC		93% TC		94% TC			95% TC	
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg		Volume, tonne	Price, USD/kg
1	Argentina	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	25.000	29.58	493.000	21.02	6,160.000	23.39	216.000	28.92	6,476.590
2	The US	0.000	/	4,958.725	7.62	0.000	/	3,219.035	7.66	0.000	/	0.000	/	0.000	/	0.000	/	1,789.367	24.66	24.334	30.41	4,135.846
3	Brazil	0.000	/	13,801.557	7.94	0.000	/	1,241.234	8.18	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	3,909.646
4	Russia	0.000	/	900.722	8.00	0.000	/	208.050	9.17	241.600	11.39	0.000	/	395.320	24.22	113.200	20.45	286.000	29.69	24.000	21.98	1,175.663
5	India	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	1,032.000	20.90	0.000	/	970.080
6	Paraguay	0.000	/	151.312	7.36	310.144	11.87	78.000	10.39	0.000	/	168.000	16.49	0.000	/	0.000	/	0.000	/	0.000	/	295.940
7	Australia	0.000	/	268.613	7.77	61.082	11.58	71.162	7.90	0.000	/	0.000	/	0.000	/	0.000	/	25.860	27.27	0.000	/	139.781
8	Turkey	0.000	/	1.900	8.42	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	68.000	21.89	10.000	28.30	24.600	20.25	96.485

No.	Country	Formulation						Technical														Total (100% AI clethodim), tonne
		120g/L EC		240g/L EC		360g/L EC		37% TK		50% TK		70% TK		90% TC		93% TC		94% TC		95% TC		
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
9	Kazakhstan	0.000	/	216.712	10.24	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	54.178
10	Canada	0.000	/	16.098	7.59	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	28.894	23.59	0.000	/	31.185
11	Mexico	0.000	/	30.400	29.15	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	16.000	10.43	22.800
12	France	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	20.000	30.75	0.000	/	18.800
13	Italy	0.000	/	42.365	7.60	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	8.245	23.70	18.424
14	Egypt	0.000	/	26.049	8.92	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	10.000	23.59	0.000	/	15.912
15	Chile	0.000	/	32.815	13.93	0.000	/	18.000	10.79	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	14.864
	Others	42.855	5.46	240.087	8.41	2.812	11.75	36.120	9.33	0.000	/	2.916	11.28	0.000	/	0.000	/	0.000	/	0.000	/	81.582
	Total	42.855	5.46	20,687.354	7.93	374.038	11.82	4,871.601	7.93	241.600	11.39	170.916	16.40	420.320	24.54	674.200	21.02	9,362.121	23.59	313.179	26.74	17,457.776

Source: Tranalysis

Table 3.1-9 China's exports of clethodim by destination, 2021

No.	Country	Formulation						Technical												Total (100% AI clethodim), tonne
		120g/L EC		240g/L EC		360g/L EC		37% TK		70% TK		90% Tech.		93% Tech.		94% Tech.		95% Tech.		
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
1	Brazil	905.380	4.97	16,148.099	6.24	0.000	/	1,619.115	7.75	0.010	0.70	0.000	/	0.010	60.00	0.000	/	1.014	16.19	4,745.723
2	The US	518.324	4.14	1,961.224	7.05	0.000	/	3,263.091	7.14	0.000	/	0.000	/	0.000	/	1,397.832	17.29	208.250	15.65	3,271.648

3	Argentina	0.000	/	147.000	13.03	72.252	8.84	0.000	/	0.000	/	0.000	/	271.010	15.42	3,305.804	15.93	406.400	29.51	3,808.336
4	Paraguay	6.888	7.16	847.560	5.03	140.246	12.65	2,172.080	6.12	24.000	0.07	0.000	/	0.000	/	0.000	/	0.000	/	1,083.675
5	Russia	0.000	/	628.332	5.98	0.000	/	242.000	7.44	0.000	/	48.200	14.80	0.000	/	52.912	13.38	34.000	32.57	372.040
6	Ukraine	205.052	6.59	86.995	9.30	14.400	10.07	8.120	9.00	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	54.543
7	India	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	236.000	23.20	0.000	/	221.840
8	Mexico	0.000	/	220.220	25.75	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.012	0.18	0.000	/	55.066
9	Australia	0.000	/	158.699	5.79	40.220	8.44	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	54.154
10	Kazakhstan	0.000	/	130.256	8.32	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	32.564
11	Uruguay	0.000	/	91.200	5.70	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	22.800
12	Turkey	0.000	/	12.110	6.56	0.000	/	0.000	/	0.000	/	0.000	/	15.000	27.35	20.200	16.07	16.000	14.90	51.166
13	Peru	17.988	5.73	32.662	6.00	0.000	/	8.480	6.38	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	13.462
14	Vietnam	55.000	3.52	3.000	5.50	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	7.350
15	Chile	0.000	/	42.844	9.71	0.000	/	9.000	7.22	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	14.041
Others		13.769	0.00	147.708	0.00	0.000	/	7.424	0.00	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	41.326
Total		1,722.401	4.88	20,657.909	6.55	267.118	10.85	7,329.310	6.99	24.010	9.91	48.200	14.80	286.020	16.04	5,012.760	16.63	665.664	24.96	13,849.733

Source: Tranalysis

Table 3.1-10 China's exports of clethodim by destination, 2020

No.	Country	Formulation														Total (100% AI clethodim), tonne
		120g/L EC		240g/L EC		37% TK		90% Tech.		93% Tech.		94% Tech.		95% Tech.		
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
1	Argentina	0.000	/	2,601.536	6.75	0.000	/	431.000	15.64	167.000	18.40	2,959.200	17.94	12.000	19.95	3,986.642
2	Brazil	52.800	4.69	9,591.990	7.22	1,648.820	7.35	0.000	/	0.000	/	0.000	/	0.000	/	3,014.397
3	The US	93.240	1.41	2,136.723	4.11	3,296.254	3.10	0.000	/	0.000	/	22.400	14.00	0.000	/	1,786.040
4	Paraguay	0.000	/	1,816.618	6.84	1,053.400	7.77	0.000	/	0.000	/	0.000	/	0.000	/	843.913
5	Uruguay	0.000	/	816.484	6.31	164.000	7.71	0.000	/	0.000	/	0.000	/	0.000	/	264.801
6	Russia	21.168	5.44	654.038	6.29	192.000	8.49	78.000	12.70	0.000	/	152.800	16.65	0.000	/	450.922
7	Kazakhstan	0.000	/	124.284	7.84	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	31.071
8	Ukraine	102.145	4.45	157.392	7.60	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	51.605
9	Peru	9.153	4.59	36.156	6.93	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	10.137
10	Saudi Arabia	0.000	/	75.188	4.98	2.400	12.01	0.000	/	0.000	/	0.000	/	0.000	/	19.685
11	Colombia	0.000	/	30.329	7.86	8.000	7.09	0.000	/	0.000	/	0.000	/	0.000	/	10.542
12	Vietnam	35.864	3.98	14.994	5.80	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	8.052
13	Chile	0.000	/	86.605	7.93	36.000	7.60	0.000	/	0.000	/	0.000	/	0.000	/	34.971
14	Australia	154.000	5.33	836.512	6.48	401.620	7.28	0.000	/	0.000	/	216.000	16.52	0.000	/	579.247
15	Ecuador	0.000	/	18.946	10.27	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	4.737

No.	Country	Formulation														Total (100% AI clethodim), tonne
		120g/L EC		240g/L EC		37% TK		90% Tech.		93% Tech.		94% Tech.		95% Tech.		
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
	Others	121.077	/	441.439	/	212.020	/	0.020	/	0.000	/	18.750	/	0.002	/	220.981
	Total	589.447	4.18	19,439.234	6.66	7,014.514	5.47	509.020	15.19	167.000	18.40	3,369.150	17.76	12.002	19.95	11,317.743

Source: Tranalysis

Table 3.1-11 China's exports of clethodim by destination, 2019

No.	Country	Formulation				Technical												Total (100% AI clethodim), tonne
		120g/L EC		240g/L EC		37% TK		70% TK		90% Tech.		93% Tech.		94% Tech.		95% Tech.		
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
1	Argentina	0.000	/	7,702.923	8.03	514.000	10.53	0.000	/	191.400	23.39	68.000	20.88	899.990	23.46	89.000	21.89	3,281.951
2	The US	0.000	/	1,699.325	8.01	2,956.000	10.18	0.000	/	0.000	/	0.000	/	1,092.000	17.73	0.000	/	2,545.031
3	Brazil	0.000	/	7,161.427	7.56	1,184.019	9.75	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	2,228.444
4	Paraguay	0.000	/	971.934	8.44	1,429.051	9.57	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	771.732
5	Israel	0.000	/	0.000	/	1,864.020	10.23	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	689.687
6	Australia	0.000	/	655.428	9.09	184.000	10.20	50.000	22.28	0.000	/	0.000	/	144.000	21.56	0.000	/	402.297
7	Uruguay	4.650	5.00	1,304.204	8.38	123.600	9.32	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	372.341
8	Colombia	0.000	/	54.393	9.96	815.794	10.64	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	315.442
9	Russia	0.000	/	401.134	8.56	238.025	13.60	64.000	15.67	62.000	23.48	0.000	/	0.600	29.00	0.000	/	289.517

No.	Country	Formulation				Technical												Total (100% AI clethodim), tonne
		120g/L EC		240g/L EC		37% TK		70% TK		90% Tech.		93% Tech.		94% Tech.		95% Tech.		
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
10	Chile	0.000	/	504.262	8.58	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	126.066
11	Bolivia	0.000	/	478.070	8.05	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	119.518
12	South Africa	0.000	/	163.856	8.41	0.000	/	0.000	/	0.000	/	0.000	/	36.400	17.53	0.000	/	75.180
13	France	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	72.000	23.52	0.000	/	67.680
14	Turkey	1.920	5.92	43.322	8.31	0.000	/	0.000	/	10.000	24.45	0.000	/	4.000	25.96	25.800	20.27	48.331
15	Kazakhstan	0.000	/	183.558	10.79	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	45.890
Others		317.019	5.29	768.002	8.92	75.277	12.01	0.600	11.28	7.000	13.52	0.000	/	3.600	16.31	1.400	23.80	269.329
Total		323.589	5.32	22,091.838	8.35	9,383.786	10.56	114.600	18.80	270.400	22.66	68.000	20.88	2,252.590	20.48	116.200	21.62	11,648.436

Source: Tranalysis

Table 3.1-12 China's exports of clethodim by destination, 2018

No.	Country	Formulation				Technical										Total (100% AI clethodim), tonne
		120g/L EC		240g/L EC		37% TK		70% TK		90% Tech.		94% Tech.		95% Tech.		
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
1	The US	0.000	/	1,674.135	8.12	5,040.248	10.74	0.000	/	0.000	/	352.800	18.90	0.000	/	2,615.058
2	Argentina	0.000	/	4,857.346	7.83	620.000	10.44	0.000	/	350.600	24.72	74.000	22.51	0.000	/	1,828.836
3	Brazil	0.000	/	5,044.579	7.81	34.000	9.46	0.000	/	0.000	/	0.000	/	0.000	/	1,273.725

No.	Country	Formulation				Technical										Total (100% AI clethodim), tonne
		120g/L EC		240g/L EC		37% TK		70% TK		90% Tech.		94% Tech.		95% Tech.		
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
4	Israel	0.000	/	0.000	/	3,084.000	9.52	0.000	/	0.000	/	0.000	/	0.000	/	1,141.080
5	Paraguay	0.000	/	1,435.198	7.77	1,462.000	9.91	0.000	/	0.000	/	0.000	/	16.000	25.26	914.939
6	Australia	0.000	/	1,098.842	9.15	312.840	10.56	75.000	19.47	79.200	22.15	18.000	23.79	0.000	/	531.161
7	Uruguay	0.000	/	1,016.925	8.12	132.000	11.10	0.000	/	0.000	/	0.000	/	0.000	/	303.071
8	Russia	5.880	5.33	558.575	8.66	107.000	11.41	96.000	15.79	42.000	22.38	0.000	/	0.000	/	284.939
9	Chile	0.000	/	363.530	7.99	96.000	8.30	0.000	/	0.000	/	0.000	/	0.100	25.99	126.497
10	South Africa	0.000	/	147.686	7.97	14.000	9.54	0.000	/	0.000	/	54.600	18.83	0.000	/	93.426
11	Saudi Arabia	0.000	/	149.066	9.21	14.000	14.24	0.000	/	0.000	/	8.000	15.10	0.000	/	49.967
12	Turkey	0.000	/	41.145	7.96	3.000	16.42	0.000	/	35.000	25.59	5.400	30.14	0.000	/	47.972
13	Thailand	0.000	/	183.533	8.41	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	45.883
14	France	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	36.000	25.37	0.000	/	33.840
15	Malaysia	0.000	/	100.898	8.02	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	25.225
	Others	135.622	4.79	614.666	8.92	88.800	13.66	0.000	/	5.200	17.43	2.910	31.39	3.200	21.01	213.253
	Total	141.502	5.01	17,286.124	8.25	11,007.888	10.43	171.000	17.24	512.000	24.00	551.710	20.40	19.300	25.29	9,528.872

Source: Tranalysis

- By exporter

Table 3.1-13 China's exports of clethodim by exporter, H1 2023

No.	Exporter	Formulation						Technical												Total (100% AI clethodim), tonne
		120g/L EC		240g/L EC		360g/L EC		37% TK		50% TK		90% TC		93% TC		94% TC		95% TC		
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
1	Jiangsu Yunfan Chemical Co., Ltd.	0.000	/	112.356	6.55	0.000	/	128.005	9.39	0.000	/	0.000	/	0.000	/	986.043	15.26	0.000	/	1,002.331
2	Shandong Cynda Chemical Co., Ltd.	0.000	/	358.734	6.73	73.400	8.66	1,023.055	8.05	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	494.638
3	Shandong Weifang Rainbow Chemical Co., Ltd.	0.000	/	360.807	7.06	52.638	9.83	588.055	6.83	0.000	/	0.000	/	0.000	/	50.000	13.37	0.000	/	373.732
4	Zhejiang Hengdian Import and Export Co., Ltd.	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	48.000	17.57	240.000	18.30	0.000	/	270.240
5	At Agro Co., Ltd.	0.000	/	0.000	/	0.000	/	613.000	5.65	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	226.810
6	Yongtaiyun (Zhejiang) Supply Chain Co., Ltd.	0.000	/	529.200	7.71	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	132.300
7	Zhejiang Chemicals Import and Export Corp.	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	138.000	/	131.100
8	Hebei Lansheng Biotech Co., Ltd.	0.000	/	147.280	7.20	0.000	/	40.000	5.95	0.000	/	0.000	/	0.000	/	8.000	18.25	36.000	16.80	93.340

No.	Exporter	Formulation						Technical												Total (100% AI clethodim), tonne
		120g/L EC		240g/L EC		360g/L EC		37% TK		50% TK		90% TC		93% TC		94% TC		95% TC		
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
9	Jebsen & Jessen Life Science Inc.	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	95.000	20.83	0.000	/	89.300
10	Gross Procedure Management International Ltd.	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	88.000	25.21	0.000	/	82.720
11	UPL Limited	584.571	10.28	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	5.000	13.23	0.000	/	74.848
12	Sino Dg International Logistics Co., Ltd.	0.000	/	291.796	7.61	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	72.949
13	ADAMA USA	0.000	/	248.928	7.89	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	62.232
14	Ningbo Tide Import and Export Co., Ltd.	0.000	/	204.336	7.20	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	51.084
15	Agroschutz GmbH	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	40.000	21.44	0.000	/	0.000	/	37.200
	Others	179.908	9.59	1,130.561	7.43	137.291	8.68	349.000	8.84	70.000	7.44	45.180	17.16	10.000	21.33	600.930	19.22	37.000	21.95	975.507
	Total	764.478	10.12	3,485.194	7.40	263.328	8.90	2,153.060	7.53	70.000	7.44	45.180	17.16	98.000	19.53	2,072.993	17.40	211.000	20.48	4,170.332

Source: Tranalysis

Table 3.1-14 China's exports of clethodim by exporter, 2022

No.	Exporter	Formulation						Technical														Total (100% AI clethodim), tonne
		120g/L EC		240g/L EC		360g/L EC		37% TK		50% TK		70% TK		90% TC		93% TC		94% TC		95% TC		
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
1	Jiangsu Yunfan Chemical Co., Ltd.	0.000	/	296.200	7.94	0.000	/	64.000	10.41	2.000	10.97	0.000	/	0.000	/	0.000	/	2,433.704	22.22	0.000	/	2,404.402
2	Shandong Cynda Chemical Co., Ltd.	0.000	/	2,609.050	7.43	0.000	/	1,503.944	7.95	0.000	/	0.000	/	0.000	/	0.000	/	37.980	23.62	0.000	/	1,464.986
3	ADAMA Ltd.	0.000	/	1,246.494	7.99	158.396	10.63	150.109	7.28	0.000	/	0.000	/	0.000	/	0.000	/	540.000	23.33	0.000	/	1,451.463
4	Shandong Weifang Rainbow Chemical Co., Ltd.	11.655	6.61	3,732.374	8.10	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	1,162.182
5	Hebei Lansheng Biotech Co., Ltd.	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	741.000	23.06	0.000	/	732.585
6	Zhejiang Hengdian Import and Export Co., Ltd.	0.000	/	549.123	7.43	0.000	/	0.000	/	0.000	/	0.000	/	20.000	27.95	108.000	20.53	340.000	21.38	18.000	19.42	696.540
7	Qiantang (Shenzhen) International Supply Chain Co., Ltd.	0.000	/	2,140.233	9.59	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	541.043
8	Suzhou Greenlands Chemical Co., Ltd.	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	511.014	24.59	0.000	/	523.720
9	UPL Limited	0.000	/	0.000	/	0.000	/	744.432	8.01	73.600	11.45	0.000	/	0.000	/	0.000	/	168.000	21.40	0.000	/	508.157
10	Shanghai Psyche	0.000	/	1,435.479	7.35	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	327.469

No.	Exporter	Formulation						Technical														Total (100% AI clethodim), tonne		
		120g/L EC		240g/L EC		360g/L EC		37% TK		50% TK		70% TK		90% TC		93% TC		94% TC		95% TC				
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg			
	Chemicals Co., Ltd.																							
11	Gross Procedure Management International Ltd.	0.000	/	0.000	/	0.000	/	820.834	7.97	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	285.010
12	Ningbo Tide Import and Export Co., Ltd.	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	75.000	27.11	229.000	24.84	0.000	/	0.000	/	261.273
13	Shenyang Sciencreat Chemicals Co., Ltd.	0.000	/	705.230	7.59	0.000	/	69.630	7.90	0.000	/	0.000	/	0.000	/	0.000	/	18.576	23.62	0.000	/	0.000	/	222.745
14	Jebsen & Jessen Life Science Inc.	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	228.000	25.01	0.000	/	0.000	/	214.320
15	Shanghai Sirius International Logistics Co., Ltd.	0.000	/	814.530	7.27	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	203.632
	Others	31.200	5.03	4,683.886	/	174.600	/	617.637	/	166.000	/	170.916	/	265.720	/	491.200	/	3,727.011	/	246.845	/	0.000	/	6,458.249
	Total	42.855	5.46	20,687.354	7.93	374.038	11.82	4,871.601	7.93	241.600	11.39	170.916	16.40	420.320	24.54	674.200	21.02	9,362.121	23.59	313.179	26.74	17,457.776		

Note: 1. Shandong Cynda Chemical Co., Ltd. was togethered with its subsidiary Liaoning Cynda Chemical Co., Ltd. 2. ADAMA Ltd. included Adama Anpon (Jiangsu) Ltd. and Adama Shanghai Trading Co., Ltd.

Source: Tranalysis

Table 3.1-15 China's exports of clethodim by exporter, 2021

No.	Exporter	Formulation						Technical												Total (100% AI clethodim), tonne
		120g/L EC		240g/L EC		360g/L EC		37% TK		70% TK		90% Tech.		93% Tech.		94% Tech.		95% Tech.		
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
1	Zhejiang Hengdian Import and Export Co., Ltd.	110.000	5.20	5,391.144	7.20	0.000	/	110.000	7.21	0.000	/	18.000	13.75	0.000	/	0.000	/	0.000	/	1,417.886
2	Shandong Cynda Chemical Co., Ltd.	0.000	/	1,193.024	5.45	0.000	/	1,923.268	3.70	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	1,009.865
3	Adama Anpon (Jiangsu) Ltd.	176.000	5.20	1,557.984	5.16	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	410.616
4	At Agro Co., Ltd.	0.000	/	110.000	7.90	0.000	/	1,044.000	5.76	24.000	9.91	0.000	/	0.000	/	0.000	/	0.000	/	430.580
5	Shandong Weifang Rainbow Chemical Co., Ltd.	12.760	4.69	285.879	12.39	92.646	15.29	15.544	10.20	0.000	/	0.000	/	0.000	/	64.000	28.69	0.000	/	172.265
6	Jiangsu Yunfan Chemical Co., Ltd.	120.960	0.00	782.716	0.00	0.000	/	167.396	3.62	0.000	/	0.000	/	0.000	/	236.000	23.20	0.000	/	493.971
7	Shanghai Psyche Chemicals Co., Ltd.	0.000	/	300.080	5.62	0.000	/	499.411	7.53	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	259.802
8	Sino-Dg International Logistics Co., Ltd.	0.000	/	823.360	5.82	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	205.840
9	Qian Tang (Shenzhen) International	0.000	/	445.480	7.93	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	111.370

No.	Exporter	Formulation						Technical												Total (100% Al clethodim), tonne
		120g/L EC		240g/L EC		360g/L EC		37% TK		70% TK		90% Tech.		93% Tech.		94% Tech.		95% Tech.		
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
	Supply Chain Co., Ltd.																			
10	Freight Overseas Co., Ltd.	0.000	/	346.056	7.94	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	86.514
11	Willchem International Trading Co., Ltd.	0.000	/	358.476	5.09	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	89.619
12	Jebsen & Jessen Life Science Inc.	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	48.000	19.19	20.000	22.80	64.120
13	Zhejiang Chemicals Import and Export Corp.	0.000	/	0.000	/	0.000	/	16.000	7.50	0.000	/	0.000	/	0.000	/	0.000	/	34.000	32.57	38.220
14	Greenlands Investment International Limited	0.000	/	0.000	/	0.000	/	234.504	5.10	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	86.766
15	China Jiangsu International Economic and Technical Cooperation Group, Ltd.	0.000	/	194.104	5.42	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	48.526
	O thers	1,302.681	3.62	8,869.606	5.24	174.472	2.88	3,319.187	2.46	0.010	1.00	30.200	15.43	286.020	16.04	4,664.760	10.92	611.664	19.28	8,923.773
	Total	1,722.401	4.88	20,657.909	6.55	267.118	10.85	7,329.310	6.99	24.010	9.91	48.200	14.80	286.020	16.04	5,012.760	16.63	665.664	24.96	13,849.733

Source: Tranalysis

Table 3.1-16 China's exports of clethodim by exporter, 2020

No.	Exporter	Formulation				Technical										Total (100% AI clethodim), tonne
		120g/L EC		240g/L EC		37% TK		90% Tech.		93% Tech.		94% Tech.		95% Tech.		
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
1	Jiangsu Yunfan Chemical Co., Ltd.	0.000	/	1,425.820	4.57	346.974	0.99	0.000	/	0.000	/	1,458.400	17.47	0.000	/	1,855.731
2	Zhejiang Hengdian Imp. & Exp. Co., Ltd.	0.000	/	1,833.987	7.38	0.000	/	0.000	/	167.000	18.40	574.000	16.79	0.000	/	1,153.367
3	Jiangsu Anpon Electrochemical Co., Ltd.	0.000	/	5,588.000	7.79	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	1,397.000
4	Shandong Weifang Rainbow Chemical Co., Ltd.	23.047	4.57	1,395.209	8.34	117.220	9.29	0.000	/	0.000	/	730.950	18.69	0.000	/	1,082.032
5	Shandong Cynda Chemical Co., Ltd.	298.200	4.78	3,196.400	5.75	1,840.640	5.40	0.020	23.00	0.000	/	0.000	/	0.000	/	1,515.939
6	Shanghai Psyche Chemicals Co., Ltd.	0.000	/	338.688	6.06	839.600	7.54	0.000	/	0.000	/	0.000	/	0.000	/	395.324
7	Sinochem Agro Co., Ltd.	0.000	/	786.856	6.01	504.000	7.48	25.000	15.44	0.000	/	36.000	18.34	0.000	/	439.534
8	Suzhou Greenlands Chemical Co., Ltd.	0.000	/	0.000	/	1,128.000	7.82	0.000	/	0.000	/	0.000	/	0.000	/	417.360
9	Ningbo Tide Import and Export Co., Ltd.	0.000	/	424.053	6.26	205.440	0.00	0.000	/	0.000	/	0.000	/	0.000	/	182.026
10	Shenyang Sciencreat Chemicals Co., Ltd.	0.000	/	574.148	7.21	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	143.537
11	Zhangjiagang Free Trade Zone Kanode Imp & Exp Co., Ltd.	0.000	/	0.000	/	365.256	2.99	0.000	/	0.000	/	0.000	/	0.000	/	135.145
12	Ningbo Jiangdong Agroskyrun Trading Co., Ltd.	0.000	/	405.650	5.65	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	101.413

No.	Exporter	Formulation				Technical										Total (100% AI clethodim), tonne
		120g/L EC		240g/L EC		37% TK		90% Tech.		93% Tech.		94% Tech.		95% Tech.		
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
13	Shandong Kesai Eagrow Chemical Co., Ltd.	0.000	/	0.000	/	0.000	/	15.000	15.96	0.000	/	69.000	15.34	0.000	/	78.360
14	Nanjing Taikenuo International Trade Co., Ltd.	0.000	/	31.040	6.68	334.000	7.84	0.000	/	0.000	/	0.000	/	0.000	/	131.340
15	Liaoning Cynda Chemical Co., Ltd.	0.000	/	0.000	/	0.000	/	82.000	18.85	0.000	/	0.000	/	0.000	/	73.800
Others		268.200	89.14	3,439.383	455.05	1,333.384	109.29	387.000	84.93	0.000	0.00	500.800	54.03	12.002	39.95	2,215.836
Total		589.447	4.18	19,439.234	6.66	7,014.514	5.47	509.020	15.19	167.000	18.40	3,369.150	17.76	12.002	19.95	11,317.743

Source: Tranalysis

Table 3.1-17 China's exports of clethodim by exporter, 2019

No.	Exporter	Formulation				Technical										Total (100% AI clethodim), tonne		
		120g/L EC		240g/L EC		37% TK		70% TK		90% Tech.		93% Tech.		94% Tech.			95% Tech.	
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg		Volume, tonne	Price, USD/kg
1	Shandong Cynda Chemical Co., Ltd.	69.910	5.47	5,457.207	7.84	3,214.020	9.67	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	2,561.878
2	Shandong Weifang Rainbow Chemical	0.000	/	4,293.664	9.61	2,167.225	11.70	0.000	/	0.000	/	0.000	/	289.600	25.17	0.000	/	2,147.513

No.	Exporter	Formulation				Technical												Total (100% AI clethodim), tonne
		120g/L EC		240g/L EC		37% TK		70% TK		90% Tech.		93% Tech.		94% Tech.		95% Tech.		
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
	Co., Ltd.																	
3	Jiangsu Yunfan Chemical Co., Ltd.	0.000	/	1,726.160	7.93	317.000	9.55	0.000	/	0.000	/	0.000	/	1,638.400	19.12	0.000	/	2,088.926
4	Zhejiang Hengdian Imp. & Exp. Co., Ltd.	0.000	/	1,170.272	8.02	36.000	10.77	0.000	/	44.000	23.15	44.000	21.04	182.000	22.90	0.000	/	557.488
5	Sinochem Agro Co., Ltd.	48.880	5.44	1,909.801	8.04	0.000	/	50.000	22.28	41.000	23.86	0.000	/	0.000	/	0.000	/	555.216
6	Suzhou Greenlands Chemical Co., Ltd.	0.000	/	167.616	7.19	1,072.000	10.35	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	438.544
7	Shanghai Psyche Chemicals Co., Ltd.	0.000	/	1,045.907	7.23	256.019	7.68	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	356.204
8	Shanghai Ouyi Chemical Co., Ltd.	0.000	/	1,128.981	7.17	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	282.245
9	Nanjing Taikenuo International Trade Co., Ltd.	0.000	/	24.000	9.90	668.000	9.95	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	253.160
10	Nanjing Bioagriland	0.000	/	604.187	7.35	17.640	9.30	0.000	/	20.000	22.85	12.000	19.63	0.000	/	30.000	21.96	215.234

No.	Exporter	Formulation				Technical												Total (100% AI clethodim), tonne
		120g/L EC		240g/L EC		37% TK		70% TK		90% Tech.		93% Tech.		94% Tech.		95% Tech.		
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
	Crop Care Co., Ltd.																	
11	Ningbo Generic Chemical Co., Ltd.	0.000	/	472.487	7.47	1.600	9.34	0.000	/	0.000	/	0.000	/	50.990	20.82	25.000	21.27	190.394
12	Jinan Ruisibang International Trade Co., Ltd.	0.000	/	23.990	7.49	337.000	12.77	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	130.688
13	Zhangjiagang Rongjiayike Trade Co., Ltd.	0.000	/	0.000	/	320.000	9.89	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	118.400
14	Shenyang Sciencreat Chemicals Co., Ltd.	0.000	/	388.724	7.89	36.000	9.63	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	110.501
15	Shanghai Kj Import and Export Co., Ltd.	0.000	/	224.076	8.11	108.000	9.41	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	95.979
	Others	204.799	5.18	3,454.766	8.44	833.282	10.57	64.600	15.63	165.400	22.69	12.000	24.10	91.600	24.12	61.200	21.60	1,546.066
	Total	323.589	5.32	22,091.838	8.35	9,383.786	10.56	114.600	18.80	270.400	22.66	68.000	20.88	2,252.590	20.48	116.200	21.62	11,648.436

Source: Tranalysis

Table 3.1-18 China's exports of clethodim by exporter, 2018

No.	Exporter	Formulation				Technical										Total (100% AI clethodim), tonne
		120g/L EC		240g/L EC		37% TK		70% TK		90% Tech.		94% Tech.		95% Tech.		
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
1	Shandong Cynda Chemical Co., Ltd.	64.037	5.20	4,574.841	7.66	3,461.040	10.02	0.000	/	0.000	/	0.000	/	0.000	/	2,431.979
2	Shandong Weifang Rainbow Chemical Co., Ltd.	0.000	/	3,063.439	9.38	859.600	11.20	0.000	/	148.000	23.50	0.000	/	0.000	/	1,217.112
3	Nutrichem Co., Ltd.	0.000	/	0.000	/	2,570.000	9.37	0.000	/	0.000	/	0.000	/	0.000	/	950.900
4	Jiangsu Yunfan Chemical Co., Ltd.	4.750	3.85	577.734	8.09	205.000	10.90	0.000	/	0.000	/	472.310	20.19	0.000	/	664.825
5	Zhangjiagang Rongjiayike Trade Co., Ltd.	0.000	/	0.000	/	832.000	12.62	0.000	/	0.000	/	0.000	/	0.000	/	307.840
6	China Jiangsu International Economic Technical Cooperation Group Co., Ltd.	0.000	/	148.185	8.42	684.000	10.19	0.000	/	0.000	/	0.000	/	0.000	/	290.126
7	Shanghai Psyche Chemicals Co., Ltd.	0.000	/	1,115.410	8.19	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	278.853
8	Sinochem Agro Co., Ltd.	0.000	/	276.504	8.95	245.000	11.67	75.000	19.47	44.000	23.96	0.000	/	0.000	/	251.876
9	Nanjing Taikenuo International Trade Co., Ltd.	0.000	/	0.000	/	666.000	9.04	0.000	/	0.000	/	0.000	/	0.000	/	246.420
10	Suzhou Greenlands Chemical Co., Ltd.	0.000	/	18.000	8.57	616.900	10.92	0.000	/	0.000	/	0.000	/	0.000	/	232.753
11	Shanghai Ouyi Chemical Co., Ltd.	0.000	/	703.780	7.53	2.000	9.18	0.000	/	0.000	/	0.000	/	0.000	/	176.685

No.	Exporter	Formulation				Technical										Total (100% AI clethodim), tonne
		120g/L EC		240g/L EC		37% TK		70% TK		90% Tech.		94% Tech.		95% Tech.		
		Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
12	Zhejiang Hengdian Imp. & Exp. Co., Ltd.	0.000	/	430.272	7.88	183.000	11.34	0.000	/	0.000	/	0.000	/	0.000	/	175.278
13	Shenyang Sciencreat Chemicals Co., Ltd.	0.000	/	660.956	7.55	23.000	9.59	0.000	/	0.000	/	0.000	/	0.000	/	173.749
14	Ningbo Generic Chemical Co., Ltd.	16.115	5.44	442.886	7.55	0.000	/	0.000	/	0.000	/	5.400	30.14	16.100	25.38	133.026
15	Yifan Biotechnology Group Co., Ltd.	0.000	/	480.356	6.95	0.000	/	0.000	/	0.000	/	0.000	/	0.000	/	120.089
Others		56.600	4.93	4,793.761	8.45	660.348	11.48	96.000	15.79	320.000	24.94	74.000	22.60	3.200	21.01	1,877.361
Total		141.502	5.01	17,286.124	8.25	11,007.888	10.43	171.000	17.24	512.000	24.00	551.710	20.40	19.300	25.29	9,528.872

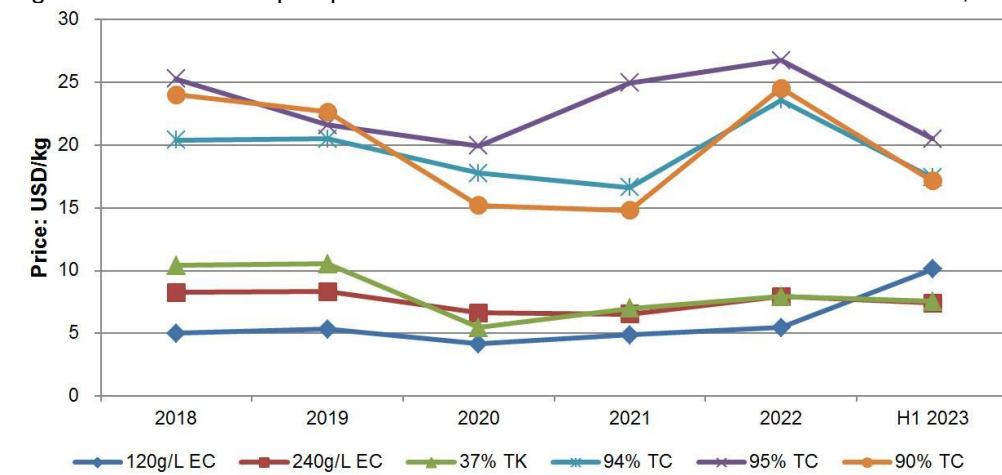
Source: Tranalysis

3.2 Export price

Export prices of clethodim formulations saw slight fluctuations over recent years, with a lasting decline from the peak in 2019 yet gradually rising since 2021, especially the export price of 120g/L EC, registering USD10.12/kg in H1 2023.

The clethodim technical export prices moved more drastically than that of the formulations. For example, the annual export price of 95% TC marked at high level before 2023, yet fell largely in H1 at USD20.48/t, approaching the figures in 2019 and 2020.

Figure 3.2-1 Annual export price of clethodim formulations and technical in China, 2018–H1 2023



Source: Tranalysis

4 Current problem

Problems have arisen in the rapid development of the domestic clethodim industry in recent years, especially when China becomes increasingly competitive amongst global rivals.

- Excessive expansion of companies may lead to overcapacity

In recent years, seeing increasing demand for clethodim at home and abroad, several domestic clethodim companies have expanded their production capacity since 2019, and some also planned to continue to expand. It's worth noting that the competition will intensify and may lead to overcapacity in the future as domestic capacity continues to increase.

- Limited varieties of clethodim formulation products

As of Sept. 2023, only three types of clethodim formulations—EC, OD and ME—were registered.

- Weak brand influence of clethodim products

In H1 2023, there were 12 Chinese enterprises producing clethodim technical, yet their brands were not prominent in the world, with exports heavily dependent on lower prices. Clethodim had its debut in the global market in 1987, whereas the production in China first came in 2003.

- Impact of genetically modified (GM) crops

The herbicide-resistant GM soybean, cotton and rapeseed have been widely planted, which is also unfavorable to the development of clethodim.

The popularity of herbicide-resistant GM crops brings a great impact to post-emergence selective herbicides including clethodim. Herbicide-resistant GM crops usually have resistance to one or several herbicides including glyphosate, glufosinate-ammonium, 2,4-D and dicamba, which makes them strong competitors to post-emergence selective herbicides. The low price of 2,4-D and glyphosate and broad weed control spectrum of these four herbicides are unfavorable to the development of post-emergence selective herbicides.

Therefore, the clethodim producers should expand the use range of clethodim and focus on exporting clethodim to the regions having relatively small acreage of GM crops.

5 Conclusion and opportunity

Clethodim has developed rapidly in the world, pushing up the development of China's clethodim industry in the last five years. In 2017–2022, the output of clethodim in China grew at an annual average growth rate of 13.30%. As of Sept., 2023, 121 enterprises have obtained the production certifications of clethodim products (including technical and formulations). Among them, 12 TC manufacturers have actively engaged in the production and construction of new capacity. It is forecasted that there will be a fiercer competition.

Clethodim has the advantages of high effectiveness, low residue and relatively lower price. Owing to the higher requirements on environmental protection at home and abroad in recent years, clethodim, as an effective and environment-friendly herbicide, gradually replaced some herbicide varieties with high residue and heavy toxicity, witnessing a rapid increase in sales.

The applicable crops of clethodim have further increased. Currently, clethodim is mainly applied to soybean fields. At the same time, its use continues to expand to broad-leaved crops such as rape, sugar beet, sunflower, cotton and vegetables and non-arable land. In particular, in raising rape, sugar beet and sunflower, clethodim has been playing an important role.

Compared with other selective post-emergence herbicides such as fluazifop-P-butyl, haloxyfop-P-methyl and quizalofop-P-ethyl, other competing products in soybean application, clethodim is superior in costs of production and application. What's more, there is a great potential for glyphosate and clethodim mixed formulations in glyphosate-tolerant crops. These also open up a good market prospect for clethodim, which is one of the reasons for the rapid development of clethodim in recent years.

From the upper reaches, Jilin Pingji Industry and Trade Co., Ltd.'s environmental impact report on 2,500 t/a pesticide intermediates phase I project was publicised on 24 May, 2023. The construction includes the production of 1,600 t/a (3-Trans-Chloroallyl) oxyamine and 900 t/a of 5-Ethylpyridine-2,3-Dicarboxylic acid diethyl ester, which can be used as intermediates for clethodim. On 24 Aug., 2022, the EIA document of Gansu Runtaihe Science and Technology Co., Ltd.'s 10,000 t/a mercaptan series products project was published on the local government's website for the first public notice, involving building of production lines for 6,000 t/a ethyl mercaptan (major intermediate for clethodim) and supporting auxiliary facilities.

These new intermediate capacities may ease the continuous tight supply of raw materials for clethodim and benefit Chinese clethodim manufacturers in terms of cost and supply efficiency, given most of the current use of ethyl mercaptan in the country is imported.

6 Contact information of major producers in China

Table 6-1 Contact information of major clethodim producers in China

No.	Producer	Tel.	Address
1	Shandong Cynda Chemical Co., Ltd.	86-543-2320028	6F Yinhe Building D, No. 2008 Xinluo Road, Hi-tech Development Zone, Jinan City, Shandong Province, P. R. China
2	Yifan Biotechnology Group Co., Ltd.	86-577-86637855	No. 555 Chang'an Road, Yaoxi Street, Longwan District, Wenzhou City, Zhejiang Province, P. R. China
3	Cangzhou Green Chemical Co., Ltd.	86-317-4852028	Xingji Town, Cangxian County, Cangzhou City, Hebei Province, P. R. China
4	Shenyang Sciencreat Chemicals Co., Ltd.	86-24-25850856	No. 17 Xihe 9th North Street, Economic and Technological Development Zone, Shenyang City, Liaoning Province, P. R. China
5	Hebei Wuqiao Pesticide Co., Ltd.	86-317-7238181	Songmen Industrial Park, Economic Development Zone, Wuqiao County, Cangzhou City, Hebei Province, P. R. China
6	Hebei Lansheng Biotech Co., Ltd.	86-311-84498010	Mayu Village, Jinzhou City, Shijiazhuang City, Hebei Province, P. R. China
7	Jiangsu Sevencontinent Green Chemical Co., Ltd.	86-512-58609901	Dongsha Chemical Zone, Zhangjiagang City, Suzhou City, Jiangsu Province, P. R. China
8	Jiangsu Yangnong Chemical Co., Ltd.	86-514-85860486	5/F High-tech Zone Building, Anqiao Road, Hanjiang District, Yangzhou City, Jiangsu Province
9	Zhongnong Ruihua (Gansu) Pharmaceutical Co., Ltd.	86-13831132042	No. 9 Xingfu Road, Yumen East Building Materials Chemical Industrial Park, Jiuquan City, Gansu Province

Source: CCM

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