

Survey of Metolachlor in China 2023

The Tenth Edition

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Researched & Prepared by:

Kcomber Inc.

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Executive summary

Metolachlor is a selective herbicide with a broad weeding spectrum, high effectiveness and wide application fields. According to statistics from the Institute for the Control of Agrochemicals, Ministry of Agriculture and Rural Affairs of the People's Republic of China (ICAMA), as of Aug. 2023, a total of 171 valid registrations of metolachlor have been licensed in China, including 18 for technical, 75 for single formulations and 78 for mixed formulations.

The metolachlor capacity decreased from 37,000 t/a in 2018 to 29,800 t/a in 2020, and then increased slightly to 30,800 t/a in 2021-H1 2023. The output of metolachlor technical declined overall from 27,200 tonnes in 2018 to 9,700 tonnes in 2021, while it bounced back to 14,600 tonnes in 2022, mainly due to the increasing demand from abroad. In H1 2023, the output of metolachlor technical was 5,300 tonnes.

Metolachlor products made in China are export-oriented. The export volume of metolachlor (calculated by 100% technical) increased from about 12,835 tonnes in 2020 to about 19,781 tonnes in 2021. Though some increase was witnessed in 2021, the export volume was still at a low level compared with that in 2018. In 2022, the export volume of metolachlor decreased from 19,781 tonnes to 17,993 tonnes, a year-on-year decrease of 9.04%. In H1 2023, the export volume of metolachlor was 2,719 tonnes.

Regarding metolachlor price in China, in 2018-2020, the annual average ex-works price of 97% metolachlor technical continued to decline. The annual average ex-works price of 97% metolachlor technical decreased from USD4,030.26/t in 2018 to USD3,308.92/t in 2020, which is the lowest point in recent years. In 2020–2022, and then saw a surge to USD7,941/t in 2022. In the first half of 2023, the annual average ex-works price of 97% metolachlor technical decreased compared to 2022, from USD7,940.53/t in 2022 to USD7935.26/t in H1 2023. The reason is that the raw material prices are weak.

In China, metolachlor technical is applied on crops through single formulations of 720g/L EC and 960g/L EC and mixtures of the product with bensulfuron-methyl, atrazine and mefenacet. And metolachlor is mainly applied to corn, vegetables, soybean and some other cash crops in China. In 2022, the consumption volume of metolachlor technical in China decreased for the first time since 2018, dropping by 0.66% year on year to 3,498 tonnes. In the first half of 2023, the consumption of metolachlor accounted for approximately 65% or more of the entire year. This is because the first half of the year is the peak season for herbicide consumption, and crops such as cotton have already been sown in the first half of the year. The consumption which applied on corn, vegetables and soybeans was relatively high, accounting for over 70% of the total consumption in China.

Because of draconian environmental inspection at home and increasing production costs, the supply of metolachlor technical in China has been relatively tight in 2022. For the supply side, in the first half of 2023, the output of metolachlor technical was lower than that of the same period, and it is expected that the output in 2023 will be lower than that in 2022. However, due to the growth of foreign and domestic demand, it is expected that the output of metolachlor technical will increase slightly from 2024 to 2026. However, after the newly built S-metolachlor starts production, it is expected that the the output of metolachlor technical will decrease in 2027-2028. For the demand side, it's estimated that consumption of metolachlor technical in China will enjoy a slight increase in 2023-2025 with more metolachlor being applied on crops as a substitute for acetochlor. But domestic demand for metolachlor technical may decrease in 2026-2028.

Methodology and source

This report is drafted by diverse methods as follows:

(1) Desk research

The sources of desk research are various, including published journals, government statistics, industrial statistics, Customs statistics, as well as information from the Internet. Obtained information has been compiled and analysed. When necessary, checks will be made with Chinese metolachlor suppliers regarding market information such as key producers, production and price trend, etc.

(2) Telephone interview

Extensive telephone interviews have been carried out in order to grasp the actual market situation of metolachlor in China.

Interviewees cover:

- Producers
- Traders

(3) Internet search

CCM contacted the players in this industry through B2B websites and software.

Data processing and presentation

The data collected and compiled were sourced from:

- Published articles from periodicals, magazines and journals
- Statistics from local governments and international institutes
- Telephone interviews with domestic suppliers, traders and industrial experts
- Third-party data providers
- Information from the Internet

Data obtained 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 made in order to analyse the data and have conclusions drawn.

Abbreviation & full name

Table null-1 Abbreviations and full names in this report

Abbreviation	Full name
AI	Active ingredient
CAGR	Compound annual growth rate
ICAMA	The Institute for the Control of Agrochemicals, Ministry of Agriculture of the People's Republic of China
EA	Effervescent granule
EC	Emulsifiable concentrate
FG	Fine granule
OD	Oil dispersion/Oil-based suspension concentrate
SC	Suspension concentrate
SE	Suspension emulsion/Suspo-emulsion
TC	Technical material

Abbreviation	Full name
WP	Wettable powder
EW	Emulsion, oil in water
ME	Micro-emulsion
GR	Granule

Source: CCM

Unit

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

Table null-2 USD/CNY exchange rate, Jan. 2018–Sept. 2023

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
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
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	/	/	/	/

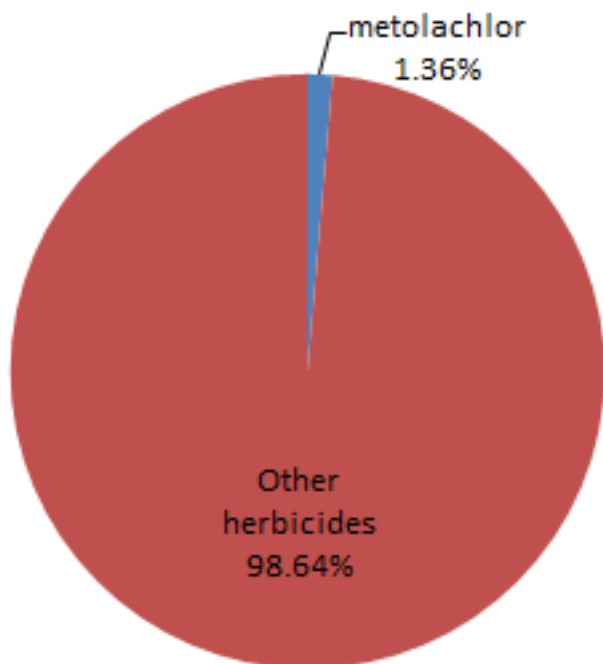
Source: The People's Bank of China

1 Overview of metolachlor industry in China

1.1 Position of metolachlor in China's herbicide industry

From 2018 to 2021, the share of metolachlor in the herbicide industry (based on output) declined continuously. In 2022, the output of herbicides decreased by 1.5% compared with 2021, but the output of metolachlor increased, and the share of metolachlor in the herbicide industry (based on output) increased from about 0.89% in 2021 to about 1.36% in 2022. The share of metolachlor export volume in herbicide export volume decreased from about 3.48% in 2021 to about 2.94% in 2022.

Figure 1.1-1 Output share of metolachlor in herbicide industry in China, 2022



Source: NBS and CCM

1.2 Brief introduction to pesticide industry in China

- Supply and demand

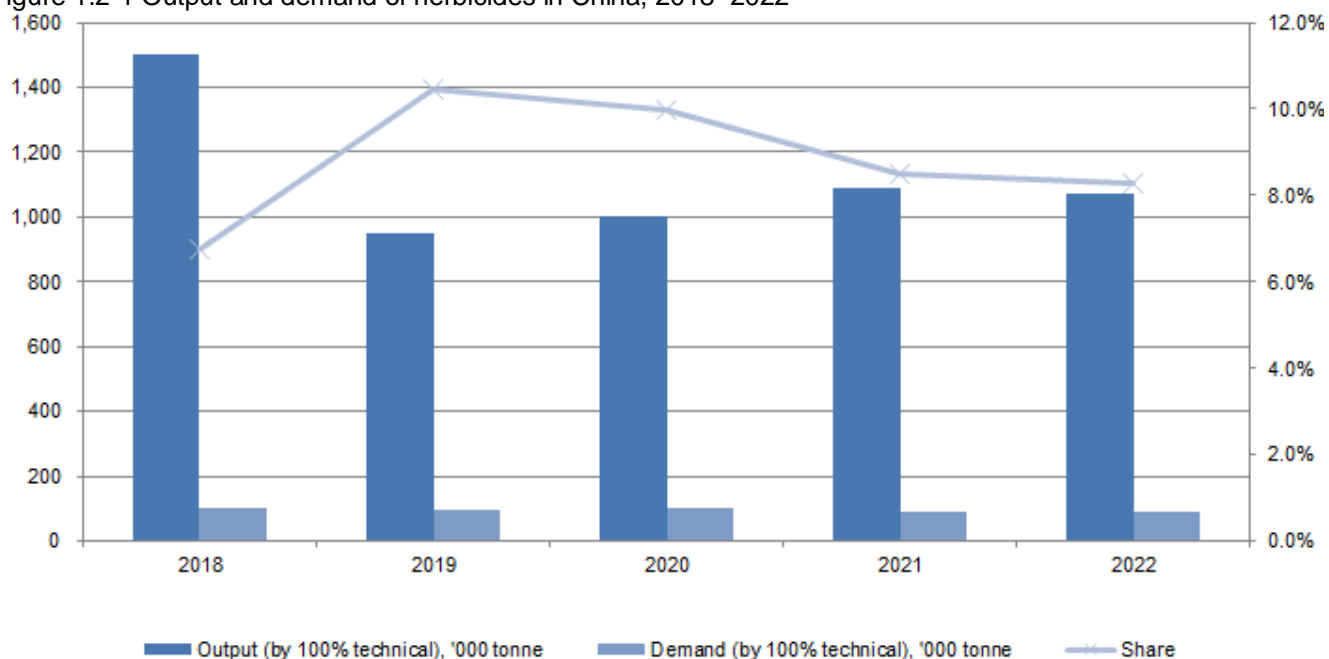
China is now the world's largest exporter of pesticides, and herbicide is an important pesticide category. In recent years, amid rising labor costs as well as the pursuit of higher efficiency and cost-effectiveness, herbicides have been widely used in agricultural production. However, the abuse of herbicides can easily lead to the deterioration of the ecological environment and soil fertility. Therefore, in recent years, multiple environmental policies have been introduced, and the overall output of herbicides in China is relatively low compared to before 2018. In terms of output, in 2019, the output of herbicides significantly decreased, mainly due to the impact of the Xiangshui explosion accident that caused many manufacturers to stop production that year. From 2019 to 2021, the output of herbicide rebounded slightly. But in 2022, the output of herbicides began to decline again. In terms of share, compared to 2018, the share increased significantly in 2019, mainly due to the significant decrease in herbicide output, while the demand for herbicides was relatively stable. From 2019 to 2022, the share decreased from 10.44% to 8.30%.

In terms of export, in 2022 China exported 1,058,822 tonnes of pesticides (converted to 100% technical; the same hereinafter), up by 6.06% year on year. The export volume of herbicides in 2022 stood at 612,663 tonnes, up by 7.89% year on year; and it accounted for more than 57% of total pesticide exports, a share nearly 1 percentage points higher than that in 2021. The total value of herbicide exports rocketed by some 50% year on year to USD7.3 billion. From the perspective of the proportion of herbicide export volume and export value, from 2018 to 2021, the proportion of export volume was greater than the proportion of export value. However, in 2022, the proportion of export value was higher than the export volume, and the proportion of export value has continuously increased in the past three years, indicating a trend of herbicide products from low added value to high added value.

With the structural adjustment of the pesticide industry and the development of products with higher added value and efficacy, the structure of pesticide output in China has improved. China's output proportion of

herbicides showed a general downtrend in 2018–2022. In 2022, the proportion of herbicides was around 60.34%, which means that herbicide still predominates in pesticides produced in China.

Figure 1.2-1 Output and demand of herbicides in China, 2018–2022



Note: Share=Demand/Output

Source: The National Bureau of Statistics of China (NBS) and CCM

- Export

Table 1.2-1 China's exports of pesticides and herbicides, 2018–2022

Year	Herbicides		Pesticides		Share of herbicides/pesticides	
	export volume, tonne	export value, million USD	export volume, tonne	export value, million USD	export volume	export value
2018	649,000	4,501	1,022,000	8,729	63.50%	51.57%
2019	545,000	3,653	915,000	7,787	59.56%	46.91%
2020	594,000	3,247	968,000	7,000	61.36%	46.38%
2021	567,867	4,875	998,297	9,502	56.88%	51.31%
2022	612,663	7,316	1,058,822	12,278	57.86%	59.58%

Note: Export volume of pesticides and herbicides is calculated by 100% technical.

Source: The National Bureau of Statistics of China (NBS) and CCM

2 Registration of metolachlor in China

As of 29 Aug., 2023, a total of 18 metolachlor technical have been registered, with the highest registration being 12 with a technical content of 96%. 153 formulations containing the active ingredient of metolachlor have been registered, including 75 single formulations and 78 mixed formulations. Regardless of whether it is a single formulations or mixed formulations, the most registered emulsion formulations were 72 and 25, respectively. Among the mixed formulations, the suspension emulsion is the second most common form, with 24.

The registered holder of PD20093496 has changed from Lianyungang Liben Crop Technology Co., Ltd. to its subsidiary Inner Mongolia Lingsheng Crop Technology Co., Ltd. The registered holder of PD20082079 has changed from Anhui Zhongshan Chemical Co., Ltd. to Inner Mongolia Zhonggao Chemical Co., Ltd., both of which are subsidiaries of Zhejiang Zhongshan Chemical Industry Group Co., Ltd.

Table 2-1 Valid registrations of metolachlor technical in China, as of 29 Aug. 2023

No.	Registrant	Registration No.	Content	Expiry date
1	Weifang Sino-Agri United Chemical Co., Ltd.	PD20183875	98%	2028/8/20
2	Xiangshui Zhongshan Bioscience Technology Co., Ltd.	PD20173215	96%	2027/12/19
3	Zhongnongfa Henan Agrochemical Co., Ltd.	PD20140151	97%	2024/1/22
4	Anhui Ruichen Crop Protection and Engineering Co., Ltd.	PD20096132	96%	2024/6/24
5	Inner Mongolia Lingsheng Crop Technology Co., Ltd.	PD20093496	96%	2024/3/23
6	Shandong Weifang Rainbow Chemical Co., Ltd.	PD20083670	96%	2023/12/15
7	Jiangsu Changlong Agrochemical Co., Ltd.	PD20082123	93%	2028/11/24
8	Shangyu Nutrichem Co., Ltd.	PD20082118	97%	2028/11/24
9	Inner Mongolia Zhonggao Chemical Co., Ltd.	PD20082079	96%	2028/11/24
10	Nantong Jiangshan Agrochemical and Chemicals Co., Ltd.	PD20081386	96%	2028/10/28
11	Capital Industry Construction Technology Co., Ltd.	PD20081075	96%	2028/8/17
12	Shandong Zhongshi Pesticide Co., Ltd.	PD20080744	96%	2028/6/10
13	Shandong Binnong Technology Co., Ltd.	PD20080709	95%	2028/6/3
14	Jiangsu Huifeng Bio Agriculture Co., Ltd.	PD20080697	96%	2028/6/3
15	Inner Mongolia Join Dream Fine Chemicals Co., Ltd.	PD20080584	96%	2028/5/11
16	Inner Mongolia Bailing Technology Co., Ltd.	PD20080176	96%	2028/1/2
17	Jiangsu Lanfeng Biochemical Co., Ltd.	PD20070635	96%	2027/12/13
18	Hangzhou Nutrichem Co., Ltd.	PD20060080	97%	2026/4/14

Note: "Xiangshui Zhongshan Bioscience Co., Ltd." refers to "Xiangshui Zhongshan Biological Technology Co., Ltd." in previous issues.
Source: Institute for the Control of Agrochemicals, Ministry of Agriculture and Rural Affairs (ICAMA)

Table 2-2 Valid registrations of metolachlor formulations in China, as of 29 Aug., 2023

Item	Type of formulation	Number
Single formulations	EC	72
	EW	2
	ME	1
Mixed formulations	SE	24
	EC	25
	WP	12
	OD	8
	FG	3
	EA	3
	SC	2
	GR	1
Total		153

Source: ICAMA

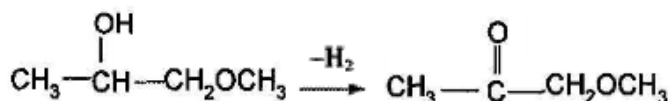
3 Supply

3.1 Production technology

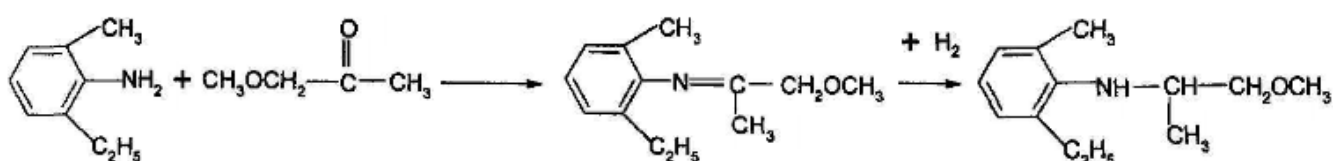
At present, three major methods for producing metolachlor technical have been reported: the methoxyacetone route, the 2-chlorine propanol route and the 2-bromo-1-methoxyl propane route. Among them, the methoxyacetone route has been put into industrial production and adopted by the producers in China.

Figure 3.1-1 Methoxyacetone route for producing metolachlor technical

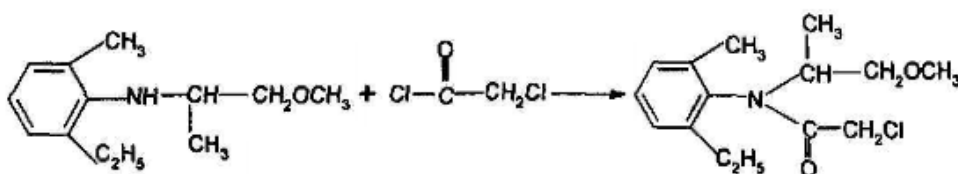
1) *Methoxyacetone synthesis*



2) *2-Methyl-6-ethyl-N-(1-methyl-2-methoxyethyl) aniline synthesis*



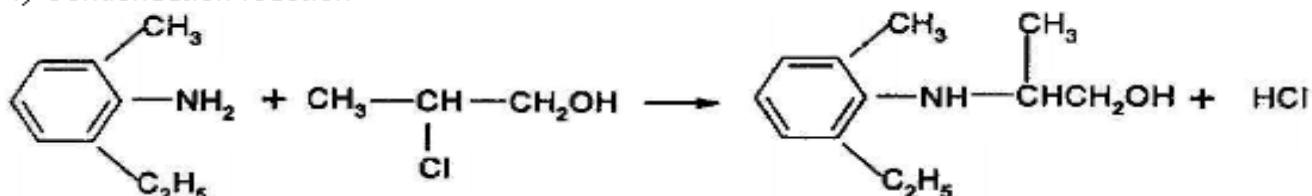
3) *Metolachlor synthesis*



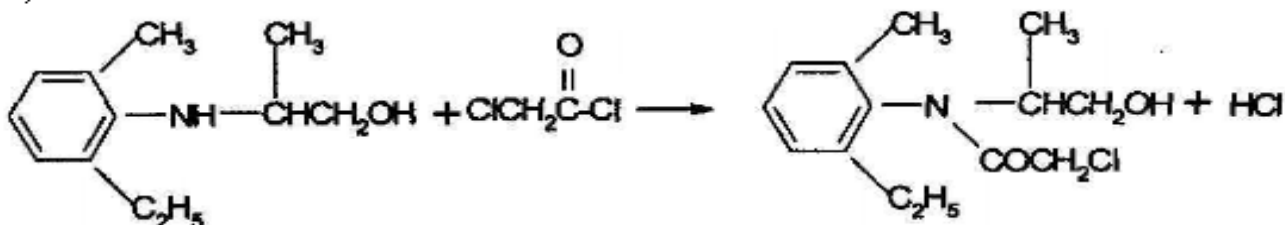
Source: *Herbicide Volume, Corpus of Global Pesticides*

Figure 3.1-2 2-Chlorine propanol route for producing metolachlor technical

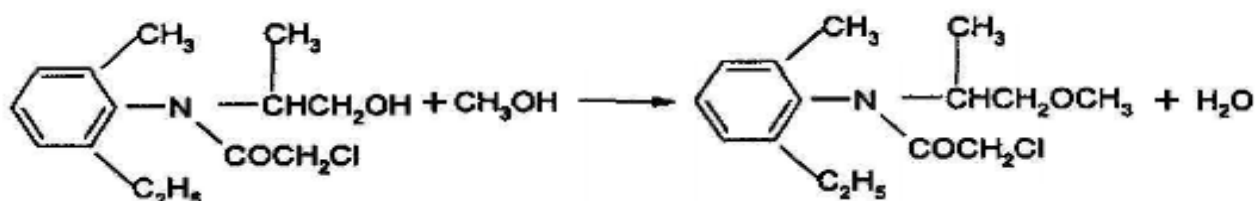
1) *Condensation reaction*



2) *Condensation reaction*

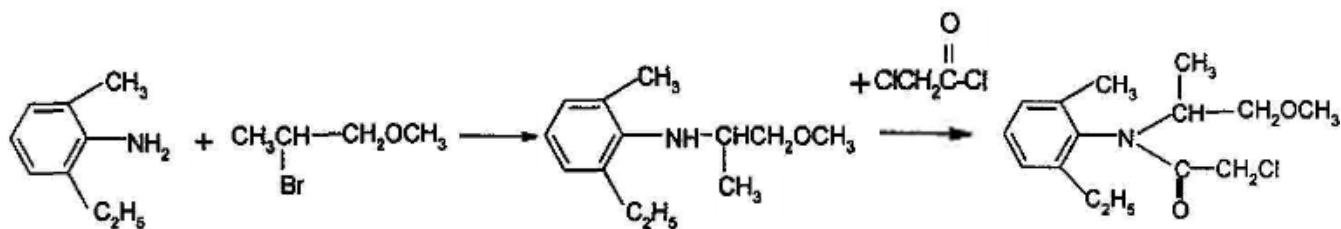


3) *Etherification*



Source: *Herbicide Volume, Corpus of Global Pesticides*

Figure 3.1-3 2-Bromo-1-methoxy propane route for producing metolachlor technical



Source: *Herbicide Volume, Corpus of Global Pesticides*

Table 3.1-1 Comparison of different routes for producing metolachlor technical

Route	Advantage	Disadvantage
Methoxyacetone route	a. The raw materials used are low-toxic. b. The yield coefficient of catalytic hydrogenation (step 2) is high. c. The general yield coefficient is high.	Attrition loss of catalysts will increase the costs of production.
2-Chlorine propanol route	/	a. The 2-chlorine propanol needed is highly toxic and volatile. b. The yield coefficient of step 2 is low.
2-Bromo-1-methoxy propane route	Fewer reaction steps	a. Requirements for equipment are high in process. b. The waste gas (HBr) is toxic.

Source: *Herbicide Volume, Corpus of Global Pesticides*

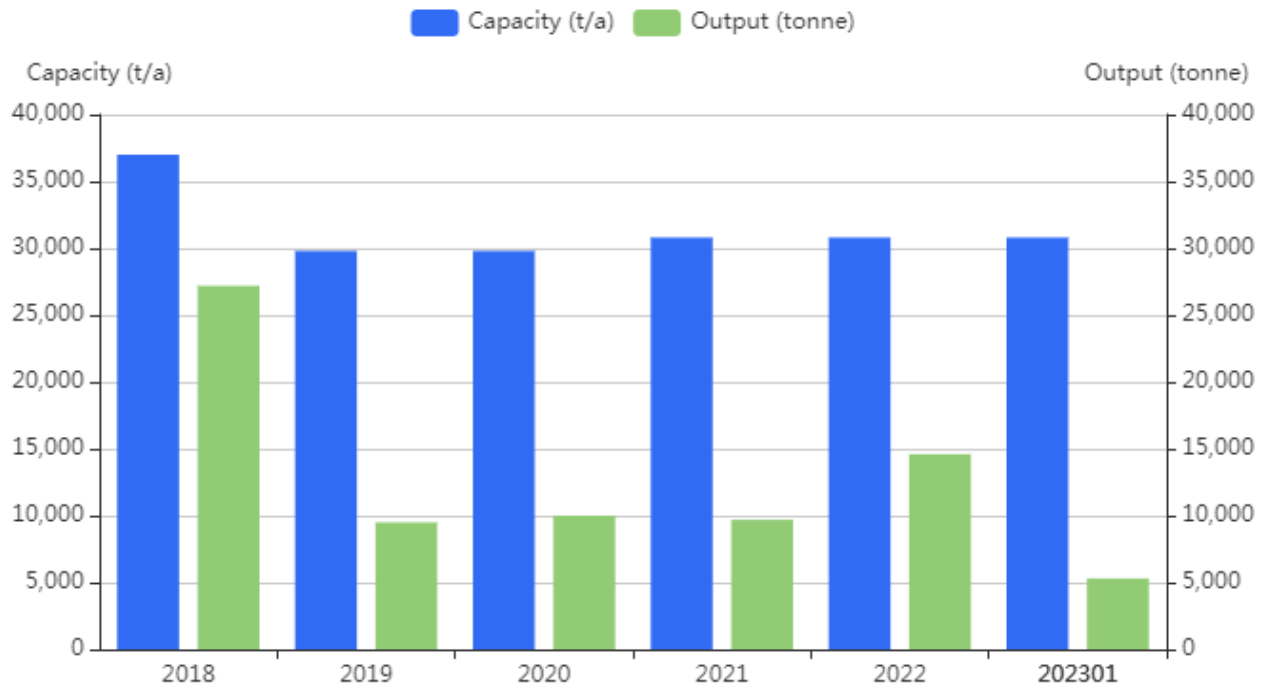
3.2 Production of metolachlor in China, 2018–June 2023

During 2018–H1 2023, the capacity of metolachlor technical in China decreased first, then basically maintained stable. The capacity decreased from 37,000 t/a in 2018 to 29,800 t/a in 2020, and then increased slightly to 30,800 t/a in 2021-H1 2023. The output of metolachlor technical declined overall from 27,200 tonnes in 2018 to 9,700 tonnes in 2021, while it bounced back to 14,600 tonnes in 2022, mainly due to the increasing demand from abroad. In H1 2023, the output of metolachlor technical was 5,300 tonnes.

In 2020, there were five metolachlor technical producers in China, which are located in Shandong, Zhejiang and Anhui provinces. In 2021, there came a new player—Nantong Jiangshan Agrochemical & Chemicals Co., Ltd., located in Jiangsu Province. Its 1,000 t/a metolachlor technical production lines entered the commissioning stage in Nov. 2021. The product-related project which was declared a special project for greening and upgrading has passed the acceptance check in Aug. 2022 by experts.

It is noteworthy that the pressure from environmental protection has been heavy. As for the potential capacity of metolachlor technical in China, Only two companies planned to build new capacity. Inner Mongolia Zhonggao Chemical Co., Ltd. planned to build a capacity of 15,000 t/a metolachlor TC. The project energy-saving report passed the expert review meeting. Shandong Weifang Rainbow Chemical Co., Ltd. planned to build a capacity of 5,000 t/a metolachlor TC. However, it is under environmental impact assessment again after changes to the previous plan. Some metolachlor producers in China had to suspend their production from time to time. For instance, in late 2017, Shandong Qiaochang Chemical Co., Ltd. suspended part of its metolachlor production lines. It is believed that environmental protection will continue to be the chief barrier to the metolachlor industry in China in the near future.

Figure 3.2-1 Capacity and output of metolachlor technical in China, 2017–2022



Note: 202301 refers to H1 2023.
Source: CCM

Table 3.2-1 Capacity and output of major metolachlor technical producers in China, 2018–H1 2023

No.	Producer	Location	Status, as of Sept. 2023	2018		2019		2020		2021		2022		H1 2023	
				Capacity, t/a	Output, tonne	Capacity, t/a	Output, tonne	Capacity, t/a	Output, tonne	Capacity, t/a	Output, tonne	Capacity, t/a	Output, tonne	Capacity, t/a	Output, tonne
1	Shandong Binnong Technology Co., Ltd.	Shandong Province	Active	20,000	12,000	12,800	2,800	12,800	3,200	12,800	4,700	12,800	6,000	12,800	1,900
2	Hangzhou Nutrichem Co., Ltd.	Zhejiang Province	Active	3,000	3,000	7,000	3,100	7,000	2,700	7,000	1,800	7,000	3,400	7,000	1,000
3	Shangyu Nutrichem Co., Ltd.	Zhejiang Province	Active	5,000	5,000	4,000	2,600	4,000	3,100	4,000	1,100	4,000	3,000	4,000	700
4	Shandong Qiaochang Chemical Co., Ltd.	Shandong Province	Active	6,000	5,600	3,000	1,000	3,000	1,000	3,000	2,100	3,000	2,200	3,000	600
5	Anhui Zhongshan Chemical Co., Ltd.	Anhui Province	Active	3,000	1,600	3,000	0	3,000	0	3,000	0	3,000	0	3,000	1,100
6	Nantong Jiangshan Agrochemical & Chemicals Co., Ltd.	Jiangsu Province	Passed the acceptance check	0	/	0	/	0	/	1000	0	1000	0	1000	0

Note: Anhui Zhongshan Chemical Co., Ltd. is a subsidiary of Zhejiang Zhongshan Chemical Group Co., Ltd.

Source: CCM

Table 3.2-2 New projects of metolachlor technical in China, as of Sept. 2023

No.	producer	Capacity,t/a	Current status
1	Inner Mongolia Zhonggao Chemical Co., Ltd	15,000	The project energy-saving report passed the expert review meeting.
2	Shandong Weifang Rainbow Chemical Co., Ltd.	5,000	It is under environmental impact assessment again after changes to previous plan.

Source: CCM

4 Circulation

4.1 Prices of metolachlor technical, 2018–June 2023

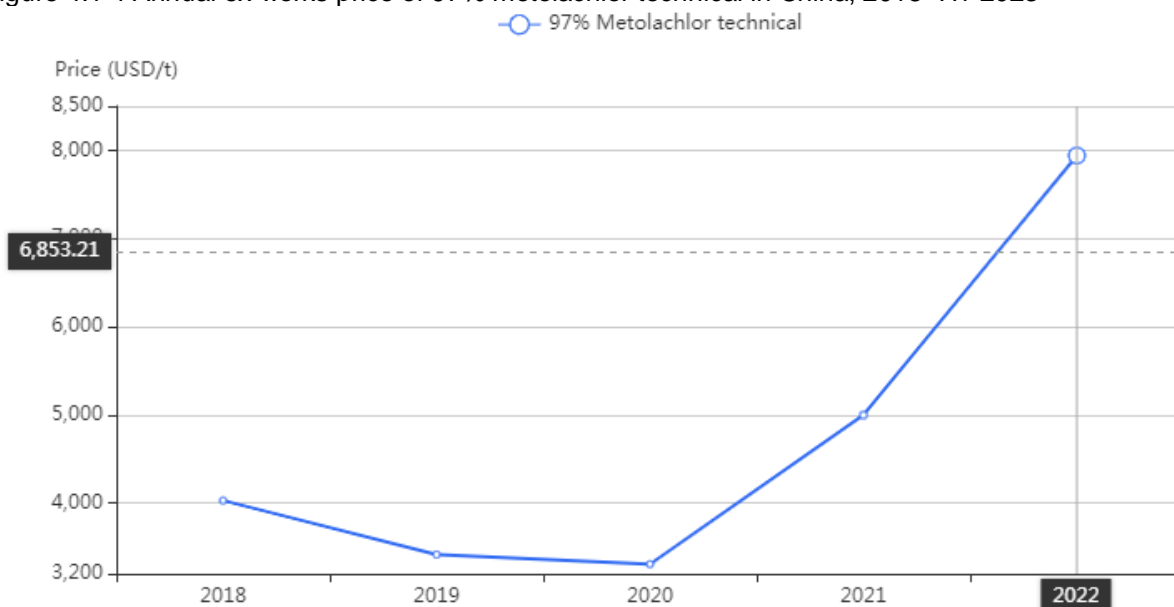
In 2018–2020, the annual average ex-works price of 97% metolachlor technical continued to decline. The annual average ex-works price of 97% metolachlor technical decreased from USD4,030.26/t in 2018 to USD3,308.92/t in 2020, the lowest point in recent years. The key reason for the price fall was the overall downturn in demand for metolachlor products in foreign markets in 2019, and thus metolachlor supply in the domestic market exceeded the demand.

In 2020–2022, the annual average ex-works price of 97% metolachlor technical saw a largely year-on-year increase from USD3,309/t in 2020 to USD7,941/t in 2022, mainly due to high production costs and limited supply.

Besides, in 2020–2022, the market saw volatile monthly prices and the monthly ex-works price rocketed to USD8,331/t in March 2022, the highest monthly ex-works price of 97% metolachlor technical in the past six years, due to high production costs and limited supply. In 2022, although the monthly ex-works price of 97% metolachlor technical has been falling since Q2, it still remained at a relatively high level in general and increased again in Q4. As an amide herbicide, the annual average ex-works price of 97% metolachlor technical is greatly influenced by raw materials. In 2022, due to the high prices of raw materials and the support of export orders, the annual average ex-works price of 97% metolachlor technical is supported.

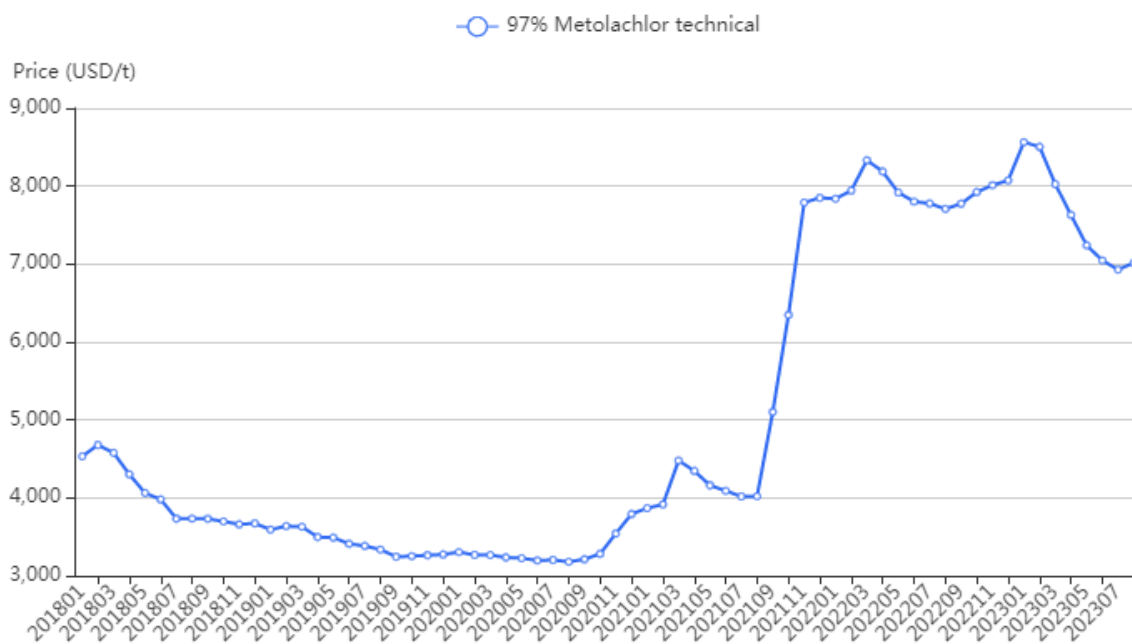
In the first half of 2023, the annual average ex-works price of 97% metolachlor technical decreased compared to 2022, from USD7,940.53/t in 2022 to USD7,935.26/t in H1 2023. The reason is that the raw material prices are weak, and the price of chloroacetyl chloride and ethanol, the raw material of metolachlor technical, have fluctuated and decreased in the first half of 2023. Meanwhile, the price of paraformaldehyde is at a lower level compared to the previous two years. The raw materials cannot effectively support the price of metolachlor technical.

Figure 4.1-1 Annual ex-works price of 97% metolachlor technical in China, 2018–H1 2023



Source: CCM

Figure 4.1-2 Monthly ex-works price of 97% metolachlor technical in China, Jan. 2018–Aug. 2023



Source: CCM

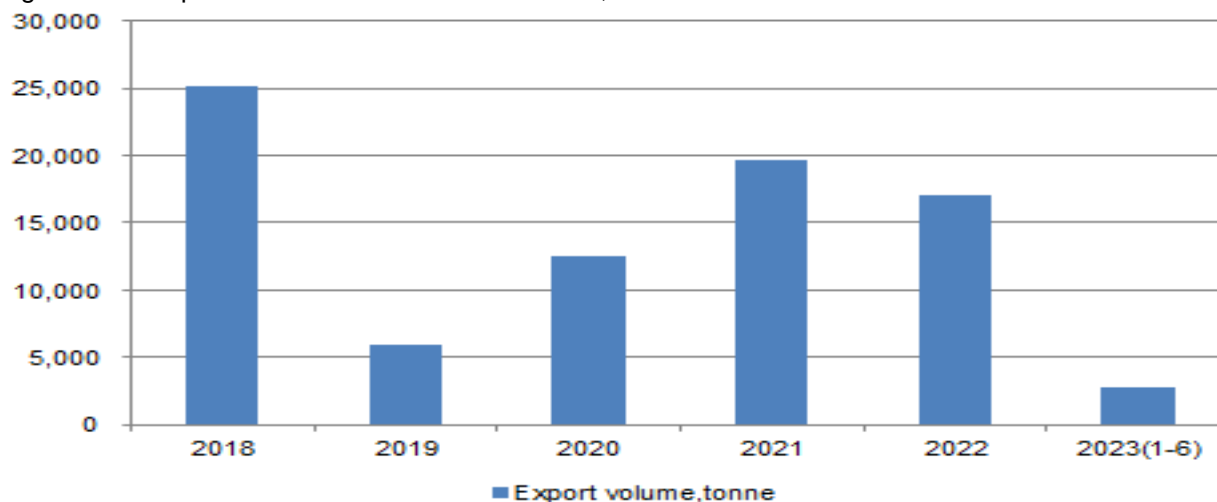
4.2 Exports of metolachlor, 2018–June 2023

Metolachlor products made in China are export-oriented. In 2016–2018, the share of annual export volume of metolachlor (calculated by 100% technical, the same hereinafter) against the national total output went up continuously. The share dipped to slightly over 60% in 2019, but bounced back strongly in 2020–2021. In 2022, the export volume of metolachlor decreased by approximately 9.04%. In China, 95% technical, 96% technical, 97% technical, 720 g/L EC and 960g/L EC are the major specifications exported. Metolachlor technical is a popular product on overseas market at present.

The export volume of metolachlor (calculated by 100% technical) in China increased from about 12,835 tonnes in 2020 to about 19,781 tonnes in 2021. Though some increase was witnessed in 2021, the export volume was still at a low level compared with that in 2018. In 2022, the export volume of metolachlor decreased from 19,781 tonnes to 17,993 tonnes, a year-on-year decrease of 9.04%.

And it is worth noting that the US was the largest overseas market for China's metolachlor for most of the time in 2018–Jun. 2023. Shandong Binnong Technology Co., Ltd. was the largest exporter for China's metolachlor in 2018–2019. In 2022, the largest exporter for China's metolachlor was Hangzhou Nutrichem Co., Ltd. In the first half of 2023, Zhangjiang Zhongshan Chemical Industry Group Co., Ltd. was the largest exporter.

Figure 4.2-1 Export volume of metolachlor in China, 2018–Jun. 2023



Note: Export volume of metolachlor is calculated by 100% technical.

Source: China Customs & CCM

- By month

Table 4.2-1 China's exports of metolachlor by month, Jan.–Jun. 2023

Month	88% EC		720g/L EC		960g/L EC		95% Tech.		96% Tech.		97% Tech.		98% Tech.	
	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg
1	70.312	8.18	0.000	/	0.000	/	32.300	8.08	0.000	/	1,678.580	9.79	0.000	/
2	527.566	8.52	2.160	10.00	143.202	8.92	0.000	/	0.000	/	4.850	8.25	20.482	9.26
3	72.864	9.43	0.000	/	0.000	/	0.000	/	7.104	13.29	0.000	/	0.000	/
4	0.000	/	0.000	/	0.000	/	16.720	7.41	21.120	7.45	58.200	7.64	0.000	/
5	0.000	/	0.000	/	32.625	9.16	0.000	/	0.000	/	0.000	/	0.000	/
6	0.000	/	13.565	8.67	11.760	6.88	0.000	/	0.000	/	5.820	6.29	0.000	/
Total	670.742	/	15.725	/	187.587	/	49.020	/	28.224	/	1,747.450	/	20.482	/

Note: The deadline for data acquisition is September 18th.

Source: China Customs and CCM

Table 4.2-2 China's exports of metolachlor by month, 2022

Month	480g/L EC		720g/L EC		960g/L EC		93% Tech.		95% Tech.		96% Tech.		97% Tech.		98% Tech.	
	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg
1	0.000	/	0.000	/	49.669	5.57	0.000	/	434.150	5.39	0.000	/	545.402	4.24	104.825	4.16
2	0.002	1.60	0.000	/	0.000	/	0.000	/	0.000	/	16.896	9.69	520.463	6.32	638.449	5.15
3	0.000	/	0.000	/	1.750	10.63	284.534	4.41	0.000	/	16.896	9.69	274.510	9.43	10.187	4.63
4	0.000	/	1.390	10.94	1.753	10.74	333.591	4.42	0.000	/	0.000	/	697.430	8.54	0.000	/

Month	480g/L EC		720g/L EC		960g/L EC		93% Tech.		95% Tech.		96% Tech.		97% Tech.		98% Tech.	
	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg
5	0.000	/	0.000	/	26.149	4.79	18.247	4.43	0.000	/	0.000	/	429.419	8.65	0.000	/
6	0.000	/	0.000	/	21.700	11.06	0.000	/	0.000	/	19.858	10.76	1,598.288	8.40	0.000	/
7	0.000	/	10.303	10.84	7.335	5.98	0.000	/	0.000	/	0.000	/	2,785.296	6.86	491.960	9.99
8	0.000	/	20.607	10.67	1.750	10.17	0.000	/	0.000	/	0.000	/	3,166.322	7.42	0.000	/
9	0.000	/	0.000	/	11.050	6.88	0.000	/	0.000	/	0.000	/	1,904.070	6.84	235.862	7.03
10	0.000	/	0.000	/	85.903	6.88	0.000	/	0.000	/	0.000	/	924.633	7.38	176.096	7.27
11	0.000	/	0.000	/	535.063	6.98	0.000	/	15.200	8.40	0.000	/	800.260	11.20	0.000	/
12	0.000	/	0.000	/	108.241	8.47	0.000	/	0.000	/	0.000	/	667.480	8.45	0.000	/
Total	0.002	/	32.300	/	850.364	/	636.371	/	449.350	/	53.650	/	14,313.573	/	1,657.380	/

Source: China Customs and CCM

Table 4.2-3 China's exports of metolachlor by month, 2021

Month	480g/L EC		720g/L EC		960g/L EC		95% Technical		96% Technical		97% Technical		98% Technical	
	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg
1	0.000	/	0.000	/	83.208	3.95	702.630	3.50	32.000	3.53	270.900	3.65	180.000	4.52
2	0.000	/	92.000	0.58	416.853	3.31	284.850	3.97	64.200	3.54	885.003	3.97	0.040	5.00
3	0.000	/	0.000	/	295.119	3.84	189.900	4.52	213.280	4.51	451.660	4.56	0.000	/
4	0.000	/	0.000	/	84.480	3.39	227.880	4.39	0.000	/	5.500	5.75	0.000	/

Month	480g/L EC		720g/L EC		960g/L EC		95% Technical		96% Technical		97% Technical		98% Technical	
	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg
5	0.000	/	0.000	/	41.800	5.64	236.140	4.92	12.000	5.69	4.000	4.60	0.000	/
6	0.000	/	0.000	/	1,329.388	5.25	132.930	4.14	17.840	5.74	127.300	5.66	0.000	/
7	0.000	/	7.800	6.79	1,513.006	5.68	405.120	4.65	0.000	/	767.620	4.10	5.060	4.36
8	0.000	/	28.325	5.01	1,037.155	5.60	75.960	4.32	17.600	5.77	1,153.487	4.10	0.000	/
9	0.000	/	9.520	5.72	721.694	5.70	0.000	/	0.000	/	1,742.911	5.18	0.000	/
10	0.000	/	0.000	/	675.418	5.87	0.000	/	0.000	/	1,249.969	6.40	35.200	4.75
11	0.000	/	18.000	5.99	392.851	7.48	0.000	/	0.000	/	2,208.713	5.91	144.680	5.50
12	22.896	4.53	0.000	/	488.738	7.88	0.000	/	18.000	9.65	624.285	4.03	35.870	4.08
Total	22.896	/	155.645	/	7,079.709	/	2,255.410	/	374.920	/	9,491.346	/	400.850	/

Source: China Customs and CCM

Table 4.2-4 China's exports of metolachlor by month, 2020

Month	720g/L EC		960g/L EC		95% Technical		96% Technical		97% Technical	
	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg
1	464.060	3.06	148.660	3.49	0.000	/	17.600	2.83	0.000	/
2	0.000	/	38.500	4.05	5.000	3.80	47.980	2.91	96.000	3.10
3	63.600	3.04	37.426	3.54	0.000	/	196.720	3.24	279.000	3.11
4	25.500	3.17	141.542	4.00	989.900	2.97	9.000	3.35	605.000	3.02
5	3.000	3.45	23.400	4.11	0.000	/	270.080	3.24	250.817	3.17
6	0.000	/	2.000	4.10	0.000	/	219.440	3.46	53.160	3.20
7	0.000	/	0.000	/	0.000	/	224.368	3.26	0.000	/
8	3.000	3.35	2.000	4.10	523.280	3.23	377.360	3.20	961.283	4.42
9	0.000	/	0.000	/	117.105	3.55	675.200	3.00	468.828	3.55
10	0.000	/	0.000	/	617.175	3.07	13.420	3.02	578.848	3.29
11	0.000	/	0.000	/	0.000	/	264.640	3.22	2,267.458	3.12
12	0.000	/	0.000	/	569.700	3.38	32.000	3.53	1,151.651	3.05
Total	559.160	/	393.528	/	2,822.160	/	2,347.808	/	6,712.045	/

Source: China Customs and CCM

Table 4.2-5 China's exports of metolachlor by month, 2019

Month	720g/L EC		960g/L EC		95% Technical		96% Technical		97% Technical	
	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg
1	141.616	3.91	165.770	3.93	0.000	/	0.000	/	148.800	3.54
2	120.500	3.64	15.400	3.74	0.000	/	0.000	/	16.000	3.40
3	79.171	3.72	9.900	4.19	12.000	3.63	64.620	3.39	87.600	3.83
4	0.000	/	143.230	4.35	38.600	3.99	17.000	3.50	254.000	3.19
5	4.000	4.16	98.453	4.13	260.200	3.51	13.420	3.41	420.000	3.18
6	73.265	3.23	30.800	4.12	148.600	3.49	0.200	3.46	272.400	3.63
7	34.720	3.57	197.460	3.99	301.200	3.42	53.280	3.95	110.000	3.32
8	29.090	3.93	407.814	3.76	60.600	3.35	10.120	3.00	2.000	4.43
9	170.000	3.41	44.770	3.79	49.200	3.57	22.880	3.00	0.000	/

Month	720g/L EC		960g/L EC		95% Technical		96% Technical		97% Technical	
	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg
10	26.776	3.34	155.818	4.21	748.000	3.09	4.840	3.14	35.200	3.29
11	382.000	3.13	27.729	3.53	0.000	/	9.400	3.82	138.000	3.45
12	398.408	3.06	134.786	3.64	0.000	/	0.000	/	329.360	3.21
Total	1,459.546	/	1,431.930	/	1,618.400	/	195.760	/	1,813.360	/

Source: China Customs and CCM

Table 4.2-6 China's exports of metolachlor by month, 2018

Month	720g/L EC		960g/L EC		95% Technical		96% Technical		97% Technical	
	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg
1	126.000	3.44	129.140	4.70	750.000	4.20	17.600	4.06	528.000	3.94
2	0.000	/	20.900	5.48	252.000	4.21	214.000	4.25	99.200	4.20
3	0.000	/	146.194	5.06	818.300	4.18	293.800	4.28	280.000	4.21
4	0.000	/	85.580	5.22	84.750	4.18	434.800	4.38	417.625	4.63
5	0.630	3.95	64.970	4.79	54.000	4.10	345.200	4.39	1,529.200	3.87
6	5.775	4.17	64.769	4.52	1,278.600	3.91	0.000	/	1,105.200	3.76
7	17.000	4.03	385.662	4.70	997.900	3.85	265.000	3.70	523.000	3.92
8	8.880	4.97	431.563	5.28	2,028.900	3.81	25.000	3.88	2,182.800	3.74
9	0.770	4.21	252.573	4.21	549.000	3.60	52.800	3.90	994.020	3.77
10	315.000	3.38	78.870	4.37	2,483.700	3.57	0.000	/	348.000	3.77
11	156.360	3.66	121.320	4.42	1,117.000	3.85	442.600	3.52	1,041.600	3.60
12	170.650	3.69	56.980	4.23	0.000	/	909.000	3.51	707.200	3.59
Total	801.065	/	1,838.521	/	10,414.150	/	2,999.800	/	9,755.845	/

Source: China Customs and CCM

Table 4.2-7 China's exports of metolachlor by month, 2017

Month	720g/L EC		960g/L EC		95% Technical		96% Technical		97% Technical	
	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg
1	50.400	3.05	250.558	3.79	0.000	/	1,501.305	3.38	289.600	3.27
2	0.000	/	225.780	4.18	0.000	/	1,625.680	3.31	750.800	3.37

Month	720g/L EC		960g/L EC		95% Technical		96% Technical		97% Technical	
	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg	Quantity, tonne	Price, USD/kg
3	90.896	4.49	66.897	4.10	0.000	/	497.400	3.36	559.600	3.21
4	77.935	4.12	91.190	4.82	0.000	/	674.020	3.65	724.800	3.20
5	5.280	3.48	82.756	4.69	0.000	/	1,809.250	3.38	785.400	3.10
6	14.000	3.77	259.788	3.90	0.000	/	1,915.150	3.40	372.800	3.12
7	35.040	3.64	313.014	4.08	0.000	/	2,633.000	3.54	1,305.040	3.37
8	12.320	3.76	116.370	4.18	0.000	/	2,515.450	3.93	512.840	3.35
9	39.900	3.52	295.291	4.34	0.000	/	481.460	3.41	469.560	3.74
10	168.000	3.40	178.010	4.05	0.000	/	2,093.200	3.79	384.000	3.40
11	134.400	3.46	109.778	5.13	12.000	4.61	1,375.060	4.16	640.000	3.45
12	91.900	3.90	111.490	4.82	0.000	/	1,076.600	4.12	14.000	5.57
Total	720.071	/	2,100.922	/	12.000	/	18,197.575	/	6,808.440	/

Source: China Customs and CCM

- By destination

Table 4.2-8 China's export volume of metolachlor by destination, Jan.–Jun. 2023, tonne

No.	Destination	88% EC	720g/L EC	960g/L EC	95% Tech.	96% Tech.	97% Tech.	98% Tech.	Total
1	United States	670.742	0.000	0.000	0.000	0.000	1,678.580	0.000	2,349.322
2	Russia	0.000	0.000	171.027	0.000	21.120	52.380	0.000	244.527
3	Pakistan	0.000	0.000	11.760	49.020	5.760	0.000	0.000	66.540
4	Vietnam	0.000	2.160	4.800	0.000	0.000	16.490	0.000	23.450
5	Chile	0.000	0.000	0.000	0.000	0.000	0.000	20.482	20.482
6	Thailand	0.000	13.565	0.000	0.000	0.000	0.000	0.000	13.565
7	Kazakhstan	0.000	0.000	0.000	0.000	1.344	0.000	0.000	1.344
Total		670.742	15.725	187.587	49.020	28.224	1,747.450	20.482	2,719.230

Note: The deadline for data acquisition is September 18th.

Source: China Customs and CCM

Table 4.2-9 China's export volume of metolachlor by destination, 2022, tonne

No.	Destination	480g/L EC	720g/L EC	960g/L EC	93% Tech.	95% Tech.	96% Tech.	97% Tech.	98% Tech.	Total
1	United States	0.000	0.000	722.657	636.371	0.000	0.000	9,425.491	990.980	11,775.500

No.	Destination	480g/L EC	720g/L EC	960g/L EC	93% Tech.	95% Tech.	96% Tech.	97% Tech.	98% Tech.	Total
2	Argentina	0.000	0.000	0.001	0.000	388.550	0.000	4,763.864	489.020	5,641.435
3	Pakistan	0.000	0.000	13.125	0.000	60.800	33.792	34.920	31.360	173.997
4	Russia	0.000	0.000	29.750	0.000	0.000	0.000	0.000	143.080	172.830
5	Paraguay	0.000	0.000	5.602	0.000	0.000	0.000	50.440	0.000	56.042
6	Vietnam	0.000	1.390	13.553	0.000	0.000	0.000	29.158	2.940	47.041
7	Kenya	0.000	30.910	0.000	0.000	0.000	0.000	0.000	0.000	30.910
8	Panama	0.000	0.000	24.074	0.000	0.000	0.000	0.000	0.000	24.074
9	Tanzania	0.000	0.000	21.700	0.000	0.000	0.000	0.000	0.000	21.700
10	Chile	0.000	0.000	0.000	0.000	0.000	19.858	0.000	0.000	19.858
11	Ghana	0.000	0.000	11.517	0.000	0.000	0.000	0.000	0.000	11.517
12	Turkey	0.000	0.000	0.000	0.000	0.000	0.000	9.700	0.000	9.700
13	Ecuador	0.002	0.000	8.385	0.000	0.000	0.000	0.000	0.000	8.387
Total		0.002	32.300	850.364	636.371	449.350	53.650	14,313.573	1,657.380	17,992.990

Source: China Customs and CCM

Table 4.2-10 China's export volume of metolachlor by destination, 2021, tonne

No.	Destination	480g/L EC	720g/L EC	960g/L EC	95% Technical	96% Technical	97% Technical	98% Technical	Total
1	The US	0.000	0.000	12.688	2,019.270	185.680	8,250.656	107.610	10,575.904
2	Argentina	0.000	0.000	5,658.096	236.080	0.000	0.000	0.000	5,894.176
3	Ukraine	22.896	13.500	638.816	0.000	0.000	25.700	57.200	758.112
4	Canada	0.000	0.000	0.000	0.000	0.000	714.460	0.000	714.460
5	Russia	0.000	15.000	488.833	0.000	18.000	37.000	56.000	614.833
6	India	0.000	0.000	0.000	0.000	0.000	0.000	180.000	180.000
7	South Korea	0.000	0.000	0.000	0.000	0.000	179.688	0.000	179.688
8	Pakistan	0.000	0.000	0.000	0.060	171.240	0.000	0.000	171.300
9	Brazil	0.000	0.000	0.000	0.000	0.000	122.302	0.040	122.342
10	Australia	0.000	0.000	0.000	0.000	0.000	122.040	0.000	122.040
11	Panama	0.000	0.000	101.900	0.000	0.000	0.000	0.000	101.900
12	Ghana	0.000	92.000	6.917	0.000	0.000	0.000	0.000	98.917

No.	Destination	480g/L EC	720g/L EC	960g/L EC	95% Technical	96% Technical	97% Technical	98% Technical	Total
13	Paraguay	0.000	0.000	85.655	0.000	0.000	0.000	0.000	85.655
14	Tanzania	0.000	0.000	60.630	0.000	0.000	0.000	0.000	60.630
15	Vietnam	0.000	3.000	12.405	0.000	0.000	14.000	0.000	29.405
16	Turkiye	0.000	0.000	0.000	0.000	0.000	25.500	0.000	25.500
17	Kenya	0.000	22.625	0.000	0.000	0.000	0.000	0.000	22.625
18	Nigeria	0.000	0.000	13.770	0.000	0.000	0.000	0.000	13.770
19	Zambia	0.000	9.520	0.000	0.000	0.000	0.000	0.000	9.520
Total		22.896	155.645	7,079.709	2,255.410	374.920	9,491.346	400.850	19,780.776

Source: China Customs and CCM

Table 4.2-11 China's export volume of metolachlor by destination, 2020, tonne

No.	Destination	720g/L EC	960g/L EC	95% Technical	96% Technical	97% Technical	Total
1	The US	0.000	0.000	2,796.260	1,941.200	6,122.465	10,859.925
2	Argentina	0.000	0.000	20.900	109.000	413.000	542.900
3	Ukraine	312.250	124.460	0.000	48.620	35.200	520.530
4	Cote d'Ivoire	204.410	0.000	0.000	0.000	0.000	204.410
5	Pakistan	0.000	0.000	0.000	167.800	0.000	167.800
6	Russia	0.000	120.118	0.000	0.000	0.000	120.118
7	Australia	0.000	0.000	0.000	38.688	70.380	109.068
8	South Africa	0.000	0.000	0.000	0.000	64.000	64.000
9	Uruguay	0.000	61.600	0.000	0.000	0.000	61.600
10	Vietnam	6.000	4.000	0.000	26.000	0.000	36.000
11	South Korea	0.000	0.000	5.000	16.500	7.000	28.500
12	Myanmar	27.500	0.000	0.000	0.000	0.000	27.500
13	Panama	0.000	23.400	0.000	0.000	0.000	23.400
14	Nicaragua	0.000	21.230	0.000	0.000	0.000	21.230
15	Chile	0.000	17.600	0.000	0.000	0.000	17.600
16	Nigeria	0.000	11.220	0.000	0.000	0.000	11.220
17	Malaysia	1.000	6.600	0.000	0.000	0.000	7.600

No.	Destination	720g/L EC	960g/L EC	95% Technical	96% Technical	97% Technical	Total
18	Thailand	6.000	0.000	0.000	0.000	0.000	6.000
19	Tanzania	0.000	3.300	0.000	0.000	0.000	3.300
20	Suriname	2.000	0.000	0.000	0.000	0.000	2.000
Total		559.160	393.528	2,822.160	2,347.808	6,712.045	12,834.701

Source: China Customs and CCM

Table 4.2-12 China's export volume of metolachlor by destination, 2019, tonne

No.	Destination	720g/L EC	960g/L EC	95% Technical	96% Technical	97% Technical	Total
1	Argentina	0.000	0.000	532.400	0.000	920.000	1,452.400
2	Ukraine	1,104.520	203.496	0.000	0.000	30.360	1,338.376
3	The US	0.000	0.000	935.000	0.000	352.000	1,287.000
4	South Africa	8.800	676.567	123.200	10.000	185.600	1,004.167
5	Israel	0.000	0.000	0.000	0.000	256.000	256.000
6	Russia	39.856	154.143	0.000	0.000	0.000	193.999
7	Uruguay	0.000	150.860	0.000	0.000	0.000	150.860
8	South Korea	0.000	0.000	14.600	101.420	16.600	132.620
9	Zimbabwe	0.000	119.594	0.000	0.000	0.000	119.594
10	Myanmar	102.900	0.000	13.200	0.000	0.000	116.100
11	Pakistan	0.000	0.000	0.000	63.200	52.800	116.000
12	Poland	84.800	0.000	0.000	0.000	0.000	84.800
13	Senegal	50.571	0.000	0.000	0.000	0.000	50.571
14	Chile	17.760	31.240	0.000	0.000	0.000	49.000
15	Slovenia	22.896	0.000	0.000	4.840	0.000	27.736
16	Malaysia	9.608	15.400	0.000	2.400	0.000	27.408
17	Nicaragua	0.000	22.000	0.000	0.000	0.000	22.000
18	Vietnam	8.755	0.000	0.000	13.100	0.000	21.855
19	Paraguay	0.000	19.800	0.000	0.000	0.000	19.800
20	Thailand	3.000	16.720	0.000	0.000	0.000	19.720
Others		6.080	22.110	0.000	0.800	0.000	28.990

Total	1,459.546	1,431.930	1,618.400	195.760	1,813.360	6,518.996
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Source: China Customs and CCM

Table 4.2-13 China's export volume of metolachlor by destination, 2018, tonne

No.	Destination	720g/L EC	960g/L EC	95% Technical	96% Technical	97% Technical	Total
1	The US	0.000	0.000	8,919.000	1,331.000	7,060.025	17,310.025
2	Argentina	0.000	0.000	1,252.400	1,323.775	1,610.000	4,186.175
3	South Africa	0.000	1,141.221	154.000	193.600	657.200	2,146.021
4	Ukraine	631.600	93.448	0.000	0.000	0.000	725.048
5	Israel	0.000	0.000	0.000	0.000	256.000	256.000
6	Pakistan	0.000	0.000	0.000	112.000	129.600	241.600
7	Russia	0.630	150.700	0.000	5.625	0.000	156.955
8	Uruguay	0.000	145.890	0.000	0.000	0.000	145.890
9	Singapore	0.000	115.500	0.000	0.000	0.000	115.500
10	Poland	113.400	0.000	0.000	0.000	0.000	113.400
11	South Korea	0.000	0.000	43.000	13.000	43.020	99.020
12	Thailand	16.000	0.000	32.000	0.000	0.000	48.000
13	Chile	26.640	15.984	0.000	0.000	0.000	42.624
14	Malaysia	9.400	25.960	0.000	2.000	0.000	37.360
15	Paraguay	0.000	31.900	0.000	0.000	0.000	31.900
16	Vietnam	0.000	0.000	12.750	18.800	0.000	31.550
17	Zimbabwe	0.000	30.153	0.000	0.000	0.000	30.153
18	Nigeria	0.000	26.400	0.000	0.000	0.000	26.400
19	Nicaragua	0.000	22.000	0.000	0.000	0.000	22.000
20	Colombia	0.000	19.439	0.000	0.000	0.000	19.439
	Others	3.395	19.926	1.000	0.000	0.000	24.321
	Total	801.065	1,838.521	10,414.150	2,999.800	9,755.845	25,809.381

Source: China Customs and CCM

Table 4.2-14 China's export volume of metolachlor by destination, 2017, tonne

No.	Destination	720g/L EC	960g/L EC	95% Technical	96% Technical	97% Technical	Total
1	The US	0.000	0.000	0.000	11,187.200	3,920.000	15,107.200
2	Argentina	0.000	0.000	0.000	5,491.600	787.640	6,279.240
3	South Africa	12.320	915.823	0.000	643.260	52.800	1,624.203
4	Israel	0.000	0.000	0.000	16.000	1,590.000	1,606.000
5	Ukraine	453.600	451.044	0.000	96.000	252.000	1,252.644
6	Vietnam	12.700	0.000	0.000	375.470	0.000	388.170
7	Pakistan	0.000	0.000	0.000	195.000	172.800	367.800
8	Russia	0.000	250.140	0.000	0.000	0.000	250.140
9	Uruguay	51.470	188.076	0.000	0.000	0.000	239.546
10	Australia	13.300	81.540	0.000	73.505	0.000	168.345
11	South Korea	0.000	0.000	12.000	69.460	33.200	114.660
12	Zimbabwe	0.000	75.800	0.000	0.000	0.000	75.800
13	Mali	69.646	0.000	0.000	0.000	0.000	69.646
14	Ghana	50.285	0.000	0.000	0.000	0.000	50.285
15	Malaysia	12.550	34.880	0.000	0.000	0.000	47.430
16	Thailand	41.000	0.000	0.000	0.000	0.000	41.000
17	Lithuania	0.000	0.000	0.000	38.680	0.000	38.680
18	Chile	0.000	36.528	0.000	0.000	0.000	36.528
19	Nicaragua	0.000	17.600	0.000	0.000	0.000	17.600
20	Paraguay	0.000	15.400	0.000	0.000	0.000	15.400
Others		3.200	34.091	0.000	11.400	0.000	48.691
Total		720.071	2,100.922	12.000	18,197.575	6,808.440	27,839.008

Source: China Customs and CCM

- By exporter

Table 4.2-15 China's export volume of metolachlor by exporter, Jan.–Jun. 2023, tonne

No.	Company	88% EC	720g/L EC	960g/L EC	95% Tech.	96% Tech.	97% Tech.	98% Tech.	Total
1	Zhejiang Zhongshan Chemical Industry Group Co., Ltd.	191.257	0.000	0.000	0.000	0.000	467.440	0.000	658.697

No.	Company	88% EC	720g/L EC	960g/L EC	95% Tech.	96% Tech.	97% Tech.	98% Tech.	Total
2	Shandong Binnong Technology Co., Ltd.	245.942	13.565	44.385	31.920	0.000	168.536	0.000	504.347
3	Yongtaiyun (Zhejiang) Supply Chain Co., Ltd.	233.543	0.000	0.000	0.000	0.000	0.000	0.000	233.543
4	Nanjing Hengchang Biotechnology Co., Ltd.	0.000	0.000	138.402	0.000	0.000	0.000	0.000	138.402
5	Hangzhou Nutrichem Co., Ltd.	0.000	0.000	0.000	17.100	21.120	0.000	0.000	38.220
6	Qingdao Hisigma Chemicals Co., Ltd.	0.000	0.000	0.000	0.000	0.000	10.670	0.000	10.670
7	Eastchem Co., Ltd.	0.000	0.000	0.000	0.000	0.000	5.820	0.000	5.820
8	Jinan Response International Trading Co., Ltd.	0.000	0.000	0.000	0.000	5.760	0.000	0.000	5.760
9	Shandong Rainbow Agrosiences Co., Ltd.	0.000	0.000	4.800	0.000	0.000	0.000	0.000	4.800
10	Henan Friend Biotechnology Co., Ltd.	0.000	2.160	0.000	0.000	0.000	0.000	0.000	2.160
11	Pioneer International Industry Limited	0.000	0.000	0.000	0.000	1.344	0.000	0.000	1.344
Others		0.000	0.000	0.000	0.000	0.000	1,094.985	20.482	1,115.467
Total		670.742	15.725	187.587	49.020	28.224	1,747.450	20.482	2,719.230

Note: The deadline for data acquisition is September 18th.

Source: China Customs & CCM

Table 4.2-16 China's export volume of metolachlor by exporter, 2022, tonne

No.	Company	720g/L EC	95% Tech.	96% Tech.	960g/L EC	97% Tech.	98% Tech.	480g/L EC	93% Tech.	Total
1	Hangzhou Nutrichem Co., Ltd.	0.000	0.000	0.000	361.150	4,552.169	165.424	0.000	0.000	5,078.743
2	Adama Agan Ltd.	0.000	0.000	0.000	85.903	1,510.465	176.096	0.000	0.000	1,772.464
3	Sharda Cropchem Limited	0.000	0.000	0.000	0.000	526.002	579.021	0.000	417.970	1,522.993
4	Summit Agro International Ltd.	0.000	388.550	0.000	0.000	264.519	88.200	0.000	0.000	741.269
5	Shandong Binnong Technology Co., Ltd.	0.000	60.800	0.000	0.003	433.900	143.080	0.000	0.000	637.783
6	Nutrichem Co., Ltd.	0.000	0.000	0.000	0.000	526.002	0.000	0.000	0.000	526.002
7	Shanghai Bioagriland Crop Care Co., Ltd.	0.000	0.000	0.000	0.000	253.461	0.000	0.000	0.000	253.461

No.	Company	720g/L EC	95% Tech.	96% Tech.	960g/L EC	97% Tech.	98% Tech.	480g/L EC	93% Tech.	Total
8	Zhejiang Zhongshan Chemical Industry Group Co., Ltd.	0.000	0.000	0.000	0.000	197.763	0.000	0.000	0.000	197.763
9	Shandong Weifang Rainbow Chemical Co., Ltd.	0.000	0.000	0.000	1.750	50.440	70.952	0.000	0.000	123.142
10	Anasac International Corporation S.A.	0.000	0.000	0.000	0.000	106.312	0.000	0.000	0.000	106.312
11	Nanjing Bodao Logistics Co., Ltd.	0.000	0.000	33.792	0.000	0.000	0.000	0.000	0.000	33.792
12	Shandong Kesai Eagrow Co., Ltd.	30.910	0.000	0.000	0.000	0.000	0.000	0.000	0.000	30.910
13	Platform Agrotech Co., Ltd.	0.000	0.000	0.000	29.750	0.000	0.000	0.000	0.000	29.750
14	Eastchem Co., Ltd.	0.000	0.000	0.000	0.000	24.250	0.000	0.000	0.000	24.250
15	Nova Agro (HK) Ltd.	0.000	0.000	0.000	21.700	0.000	0.000	0.000	0.000	21.700
16	Nufarm Chemical (Shanghai) Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	18.247	18.247
17	Noleson Biotechnology Co., Ltd.	0.000	0.000	0.000	13.125	0.000	0.000	0.000	0.000	13.125
18	Savana	0.000	0.000	0.000	11.517	0.000	0.000	0.000	0.000	11.517
19	Leda Holding Co., Ltd.	0.000	0.000	0.000	0.000	9.700	0.000	0.000	0.000	9.700
20	Shandong Rainbow International Co., Ltd.	0.000	0.000	0.000	8.385	0.000	0.000	0.000	0.000	8.385
Others		1.390	0.000	19.858	317.081	5,858.591	434.606	0.002	200.155	6,831.683
Total		32.300	449.350	53.650	850.364	14,313.573	1,657.380	0.002	636.371	17,992.990

Source: China Customs & CCM

Table 4.2-17 China's export volume of metolachlor by exporter, 2021, tonne

No.	Exporter	480g/L EC	720g/L EC	960g/L EC	95% Technical	96% Technical	97% Technical	98% Technical	Total
1	Shandong Binnong Technology Co., Ltd.	0.000	0.000	234.856	2,018.770	171.160	1,555.344	185.200	4,165.330
2	Nutrichem Co., Ltd.	0.000	0.000	88.336	0.000	0.000	1,757.455	108.000	1,953.791
3	Hangzhou Nutrichem Co., Ltd.	0.000	0.000	0.000	223.660	0.000	1,270.039	0.000	1,493.699

No.	Exporter	480g/L EC	720g/L EC	960g/L EC	95% Technical	96% Technical	97% Technical	98% Technical	Total
4	Adama Agan Ltd.	0.000	0.000	0.000	0.000	0.000	1,427.411	0.000	1,427.411
5	Kingland Chemicals Co., Ltd.	0.000	0.000	0.000	0.000	0.000	1,115.698	0.000	1,115.698
6	Summit Agro International Ltd.	0.000	0.000	838.900	0.000	0.000	0.000	0.000	838.900
7	Nanjing Bioagriland Crop Care Co., Ltd.	0.000	0.000	619.300	0.000	0.000	0.000	0.000	619.300
8	Shandong Weifang Rainbow Chemical Co., Ltd.	0.000	0.000	546.151	12.980	0.000	5.000	0.000	564.131
9	Sharda Cropchem Limited	0.000	0.000	0.000	0.000	0.000	449.429	107.610	557.039
10	Kronos Chemical Limited	0.000	0.000	466.560	0.000	0.000	0.000	0.000	466.560
11	Shangyu Nutrichem Co., Ltd.	0.000	0.000	0.000	0.000	0.000	125.545	0.000	125.545
12	Adama Anpon (Jiangsu) Ltd.	0.000	0.000	0.000	0.000	0.000	122.302	0.040	122.342
13	Anasac International Corporation S.A.	0.000	0.000	116.800	0.000	0.000	0.000	0.000	116.800
14	Nanjing Hengchang Biotechnology Co., Ltd.	0.000	0.000	92.320	0.000	0.000	0.000	0.000	92.320
15	Agricore Chemical Industry Co., Ltd.	0.000	92.000	0.000	0.000	0.000	0.000	0.000	92.000
16	China Jiangsu International Economic and Technical Cooperation Group, Ltd.	0.000	9.520	48.030	0.000	0.000	22.000	0.000	79.550
17	Nanjing Foragro Co., Ltd.	0.000	0.000	75.200	0.000	0.000	0.000	0.000	75.200
18	Commercial H.U.B. Pte Ltd.	22.896	0.000	46.656	0.000	0.000	0.000	0.000	69.552
19	Jiangxi Huihe Chemical Co., Ltd.	0.000	0.000	58.572	0.000	0.000	0.000	0.000	58.572
20	La Forja S.A.	0.000	0.000	52.602	0.000	0.000	0.000	0.000	52.602
Others		0.000	54.125	3,795.426	0.000	203.760	1,641.123	0.000	5,694.434
Total		22.896	155.645	7,079.709	2,255.410	374.920	9,491.346	400.850	19,780.776

Source: China Customs & CCM

Table 4.2-18 China's export volume of metolachlor by exporter, 2020, tonne

No.	Exporter	720g/L EC	960g/L EC	95% Technical	96% Technical	97% Technical	Total
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No.	Exporter	720g/L EC	960g/L EC	95% Technical	96% Technical	97% Technical	Total
1	Kingland Chemicals Co., Ltd.	0.000	0.000	0.000	0.000	2,922.323	2,922.323
2	Shandong Binnong Technology Co., Ltd.	8.000	36.520	1,893.760	216.420	0.000	2,154.700
3	Nutrichem Company Limited	0.000	0.000	0.000	0.000	868.950	868.950
4	Anhui Zhongshan Chemical Co., Ltd.	0.000	0.000	0.000	641.440	0.000	641.440
5	Shangyu Nutrichem Co., Ltd.	0.000	0.000	0.000	0.000	625.600	625.600
6	Hangzhou Nutrichem Co., Ltd.	296.800	172.982	0.000	0.000	111.304	581.086
7	Zhejiang Zhongda Newland Co., Ltd.	204.410	0.000	0.000	0.000	0.000	204.410
8	Shandong Weifang Rainbow Chemical Co., Ltd.	0.000	0.000	0.000	111.000	0.000	111.000
9	China Jiangsu International Economic Technical Cooperation Group Co., Ltd.	0.000	0.000	0.000	0.000	64.000	64.000
10	Oasis AgroScience Ltd.	0.000	61.600	0.000	0.000	0.000	61.600
11	Zhejiang Chemicals Import & Export Corporation	0.000	52.896	0.000	0.000	0.000	52.896
12	Jiangsu Jinlikai Chemical Co., Ltd.	0.000	0.000	0.000	38.688	0.000	38.688
13	Xingjinshi (Xiamen) Trade Co., Ltd.	27.500	0.000	0.000	0.000	0.000	27.500
14	Ningbo Sanyi Biotechnology Co., Ltd.	0.000	21.230	0.000	0.000	0.000	21.230
15	Nanjing Essence Fine Chemical Co., Ltd.	0.000	20.900	0.000	0.000	0.000	20.900
16	Hisigma Chemicals Co., Ltd.	0.000	0.000	0.000	16.500	0.000	16.500
17	Hangzhou Ruijiang Agricultural Technology Co., Ltd.	15.450	0.000	0.000	0.000	0.000	15.450
18	Eastchem Co., Ltd.	0.000	0.000	0.000	14.000	0.000	14.000
19	Shandong Rainbow Agrosiences Co., Ltd.	0.000	4.000	0.000	10.000	0.000	14.000
20	Nanjing Bioagriland Crop Care Co., Ltd.	0.000	0.000	0.000	0.000	13.000	13.000
	Others	7.000	23.400	928.400	1,299.760	2,106.868	4,365.428
	Total	559.160	393.528	2,822.160	2,347.808	6,712.045	12,834.701

Source: China Customs & CCM

Table 4.2-19 China's export volume of metolachlor by exporter, 2019, tonne

No.	Exporter	720g/L EC	960g/L EC	95% Technical	96% Technical	97% Technical	Total
1	Shandong Binnong Technology Co., Ltd.	5.000	528.550	939.400	49.600	0.000	1,522.550
2	Nutrichem Company Limited	0.000	27.720	0.000	0.000	1,465.000	1,492.720

No.	Exporter	720g/L EC	960g/L EC	95% Technical	96% Technical	97% Technical	Total
3	Hangzhou Nutrichem Co., Ltd.	1,171.480	199.679	0.000	0.000	83.160	1,454.319
4	China Jiangsu International Economic Technical Cooperation Group Co., Ltd.	0.000	2.200	562.200	0.000	107.200	671.600
5	Suzhou Everfortune Imp. & Exp. Co., Ltd.	9.680	140.800	0.000	0.000	0.000	150.480
6	Shangyu Nutrichem Co., Ltd.	0.000	0.000	0.000	0.000	112.000	112.000
7	Hangzhou Qingfeng Import and Export Co., Ltd.	84.800	12.448	0.000	0.000	0.000	97.248
8	Hisigma Chemicals Co., Ltd.	0.000	0.000	0.000	88.000	0.000	88.000
9	Guangdong Keywa Chemical Exchange Center Stock Co., Ltd.	0.000	61.600	17.600	0.000	0.000	79.200
10	Shanghai Mingdou Chemical Co., Ltd.	0.000	71.630	0.000	0.000	0.000	71.630
11	Shandong Weifang Rainbow Chemical Co., Ltd.	21.090	17.760	0.000	17.000	0.000	55.850
12	Nanjing Red Sun Co., Ltd.	0.000	0.000	54.000	0.000	0.000	54.000
13	Zhejiang Chemicals Import & Export Corporation	0.000	52.896	0.000	0.000	0.000	52.896
14	Shanghai Chengxin Agricultural Technology Co., Ltd.	0.000	52.800	0.000	0.000	0.000	52.800
15	Shandong Kesai Eagrow Chemical Co., Ltd.	50.571	0.000	0.000	0.000	0.000	50.571
16	Eastchem Co., Ltd.	44.100	0.000	0.000	5.000	0.000	49.100
17	Xingjinshi (Xiamen) Trade Co., Ltd.	46.200	0.000	0.000	0.000	0.000	46.200
18	Nanjing Essence Fine Chemical Co., Ltd.	0.000	39.205	0.000	0.000	0.000	39.205
19	Ningbo Generic Chemical Co., Ltd.	0.000	0.000	0.000	0.000	38.000	38.000
20	Chongqing Shining Fine Chemical Co., Ltd.	0.000	37.876	0.000	0.000	0.000	37.876
	Others	26.625	186.766	45.200	36.160	8.000	302.751
	Total	1,459.546	1,431.930	1,618.400	195.760	1,813.360	6,518.996

Source: China Customs & CCM

Table 4.2-20 China's export volume of metolachlor by exporter, 2018, tonne

No.	Exporter	720g/L EC	960g/L EC	95% Technical	96% Technical	97% Technical	Total
1	Shandong Binnong Technology Co., Ltd.	18.625	501.240	10,119.100	350.575	0.000	10,989.540
2	Nutrichem Company Limited	0.000	194.040	0.000	0.000	8,108.225	8,302.265

No.	Exporter	720g/L EC	960g/L EC	95% Technical	96% Technical	97% Technical	Total
3	Zhejiang Zhongshan Chemical Industry Group Co., Ltd.	0.000	0.000	0.000	600.000	926.000	1,526.000
4	Hangzhou Nutrichem Co., Ltd.	745.630	173.008	0.000	0.000	105.600	1,024.238
5	Shandong Weifang Rainbow Chemical Co., Ltd.	26.640	70.374	0.000	846.000	0.000	943.014
6	Suzhou Everfortune Imp. & Exp. Co., Ltd.	0.770	319.000	0.000	158.400	193.600	671.770
7	Shandong Qiaochang Modern Agriculture Import & Export Co., Ltd.	0.000	0.000	0.000	425.000	0.000	425.000
8	Shanghai Agrohao International Trade Co., Ltd.	0.000	0.000	0.000	306.000	0.000	306.000
9	Nanjing Red Sun Group International Trade Co., Ltd.	0.000	0.000	196.000	0.000	0.000	196.000
10	China Jiangsu International Economic Technical Cooperation Group Co., Ltd.	0.000	2.750	0.000	35.200	88.000	125.950
11	Shandong Qiaochang Chemical Co., Ltd.	0.000	0.000	0.000	125.200	0.000	125.200
12	Shandong Runke International Trade Co., Ltd.	0.000	0.000	0.000	120.000	0.000	120.000
13	Chongqing Shining Fine Chemical Co., Ltd.	0.000	119.460	0.000	0.000	0.000	119.460
14	Jiangsu Flag International Trading Co., Ltd.	0.000	115.500	0.000	0.000	0.000	115.500
15	Nanjing Red Sun Co., Ltd.	0.000	0.000	0.000	0.000	108.000	108.000
16	Nanjing Bioagriland Crop Care Co., Ltd.	0.000	0.000	0.000	0.000	105.600	105.600
17	High Hope Zhongtian Corporation	0.000	4.400	0.000	0.000	70.400	74.800
18	Shanghai Chengxin Agricultural Technology Co., Ltd.	0.000	62.700	0.000	0.000	0.000	62.700
19	Hisigma Chemicals Co., Ltd.	0.000	0.000	29.700	0.000	26.420	56.120
20	Shanghai E-tong Chemical Co., Ltd.	0.000	46.410	0.000	0.000	0.000	46.410
Others		9.400	229.639	69.350	33.425	24.000	365.814
Total		801.065	1,838.521	10,414.150	2,999.800	9,755.845	25,809.381

Source: China Customs & CCM

Table 4.2-21 China's export volume of metolachlor by exporter, 2017, tonne

No.	Exporter	720g/L EC	960g/L EC	95% Technical	96% Technical	97% Technical	Total
1	Shandong Binnong Technology Co., Ltd.	30.700	320.144	12.000	12,610.140	0.000	12,972.984
2	Nutrichem Company Limited	0.000	110.880	0.000	0.000	6,366.040	6,476.920

No.	Exporter	720g/L EC	960g/L EC	95% Technical	96% Technical	97% Technical	Total
3	Shandong Weifang Rainbow Chemical Co., Ltd.	0.000	171.229	0.000	3,761.000	0.000	3,932.229
4	Hangzhou Nutrichem Co., Ltd.	403.200	412.940	0.000	0.000	424.800	1,240.940
5	Suzhou Everfortune Imp. & Exp. Co., Ltd.	52.640	469.128	0.000	369.600	0.000	891.368
6	Zhejiang Zhongshan Chemical Industry Group Co., Ltd.	0.000	63.056	0.000	529.105	0.000	592.161
7	Eastchem Co., Ltd.	0.000	0.000	0.000	209.270	0.000	209.270
8	Shandong Gufa Import and Export Co., Ltd.	0.000	0.000	0.000	208.000	0.000	208.000
9	Chongqing Shining Fine Chemical Co., Ltd.	0.000	140.470	0.000	0.000	0.000	140.470
10	China Jiangsu International Economic Technical Cooperation Group Co., Ltd.	0.000	57.750	0.000	35.200	17.600	110.550
11	Shanghai E-tong Chemical Co., Ltd.	0.000	103.010	0.000	0.000	0.000	103.010
12	Guangdong Keywa Chemical Trading Center Co., Ltd.	0.000	0.000	0.000	88.000	0.000	88.000
13	Hangzhou Lvhe Chemical Co., Ltd.	0.000	0.000	0.000	88.000	0.000	88.000
14	Shanghai Agrohao International Trade Co., Ltd.	0.000	0.000	0.000	80.000	0.000	80.000
15	Jinan Kesai Agrochem Co., Ltd.	69.646	0.000	0.000	0.000	0.000	69.646
16	Hisigma Chemicals Co., Ltd.	0.000	0.000	0.000	64.400	0.000	64.400
17	Shanghai MIO Chemical Co., Ltd.	50.400	5.504	0.000	0.000	0.000	55.904
18	Shandong Runke International Trade Co., Ltd.	0.000	0.000	0.000	54.000	0.000	54.000
19	Shandong Kesai Eagrow Chemical Co., Ltd.	50.285	0.000	0.000	0.000	0.000	50.285
20	United Pesticide Industry Limited	9.000	0.000	0.000	36.000	0.000	45.000
	Others	54.200	246.811	0.000	64.860	0.000	365.871
	Total	720.071	2,100.922	12.000	18,197.575	6,808.440	27,839.008

Source: China Customs & CCM

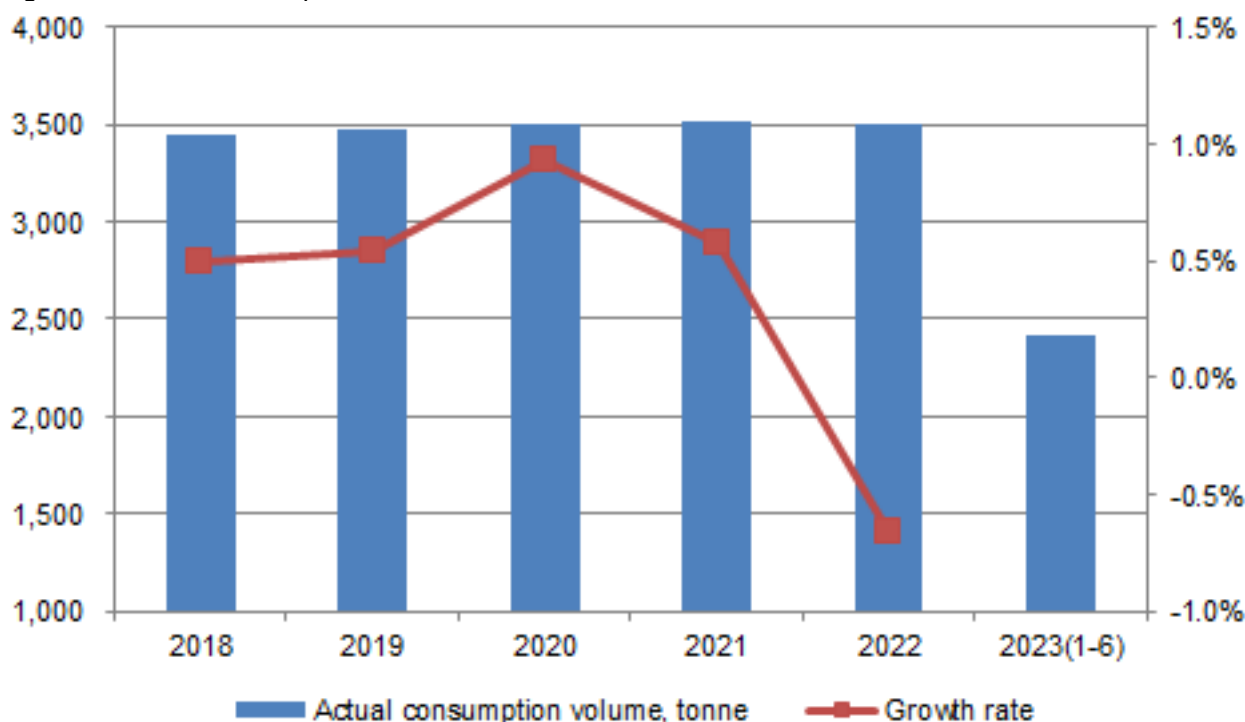
5 Consumption, 2018–June 2023

In 2022, the consumption volume of metolachlor technical in China decreased for the first time since 2018, dropping by 0.66% year on year to 3,498 tonnes. In the first half of 2023, the peak season for herbicide consumption arrived, and crops such as cotton have already been sown. Therefore, the consumption of metolachlor has accounted for approximately 65%+ of the entire year. Due to the higher consumption of metolachlor in the first half of 2023 compared to the first half of 2022, it is expected that the consumption of metolachlor throughout 2023 will be higher than in 2022.

As a substitute for acetochlor in crop planting, metolachlor is becoming popular in China at present due to its relatively safer properties. That has driven up the domestic consumption of metolachlor technical in China from 2018 to 2021. While in 2022, the domestic consumption of metolachlor technical decreased. It's worth noting that there is a strong competitive product for metolachlor, namely S-metolachlor. Though the price of S-metolachlor technical is higher, it has better performance than metolachlor. In addition, pyroxasulfone, a preemergence herbicide, is also a potential competitive product for metolachlor that can be used in most crop fields. Its mechanism of action is similar to that of acetochlor and related herbicides, but its biological activity is far greater than that of acetochlor and metolachlor. And data show that it is not an endocrine-disrupting chemical.

Generally, metolachlor technical is applied to crops through single formulations of 720g/L EC and 960g/L EC and mixtures of the product with bensulfuron-methyl, atrazine and mefenacet on the domestic market currently. And metolachlor is mainly applied to corn, vegetables, soybean and some other economic crops in China. In the first half of 2023, the consumption which applied in corn, vegetables and soybeans was relatively high, accounting for over 70% of the consumption.

Figure 5-1 Actual consumption volume of metolachlor technical in China, 2018–Jun. 2023



Note: Actual consumption volume of metolachlor is calculated by 97% technical.
Source: CCM

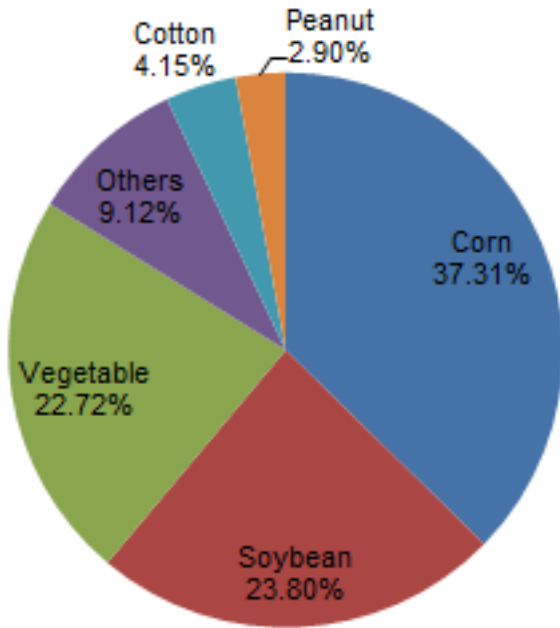
Table 5-1 Application of metolachlor technical in China by crop, H1 2023

Crop	Consumption volume, tonne
Corn	900
Soybean	574
Vegetable	548

Crop	Consumption volume, tonne
Cotton	100
Peanut	70
Others	220
Total	2,412

Source: CCM

Figure 5-2 Application share of metolachlor technical in China by crop, H1 2023



Source: CCM

6 Forecast on supply and demand, 2023–2028

- Supply

Because of draconian environmental inspection at home and increasing production costs, the supply of metolachlor technical in China has been relatively tight in 2022. In the first half of 2023, the output of metolachlor technical was lower than that of the same period, and it is expected that the output in 2023 will be lower than that in 2022. However, due to the growth of foreign and domestic demand, it is expected that the output of metolachlor technical will increase slightly from 2024 to 2026. However, after the newly built S-metolachlor starts production, it is expected that the the output of metolachlor technical will decrease in 2027-2028.

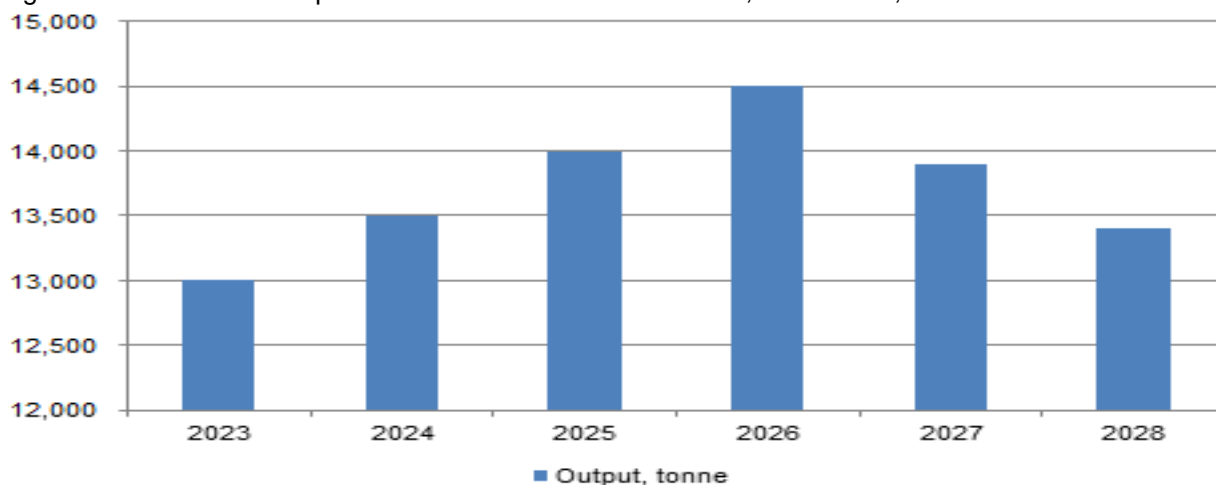
Currently, the domestic capacity of metolachlor technical can meet domestic and foreign demands, and the industry concentration ratio is high. It is hard for a new entrant to capture much market share, and the capacity will not have a large improvement in the coming years. As to capacity expansion projects, only two companies planned to build new capacity. Shandong Weifang Rainbow Chemical Co., Ltd. planned to build a 5,000 t/a metolachlor project but it is under environmental impact assessment since some changes had been made to its original plan. And Inner Mongolia Zhonggao Chemical Co., Ltd. planned to build a capacity of 15,000 t/a metolachlor TC. However, this project is currently only progressing until the energy-saving report of the project passes the expert review.

However, there are also some barriers limiting the output increase in China.

S-metolachlor may undermine metolachlor's market competitiveness. Many companies have planned to increase the capacity of S-metolachlor. Although S-metolachlor, a competitive product, is expected to be banned by the European Union, the metolachlor has already been banned by the EU. Therefore, the ban on S-metolachlor will not bring room for growth for metolachlor, and it is highly likely to compete with metolachlor in the domestic market. In addition, in the future, pyroxasulfone will also be a strong competitor to metolachlor. The mechanism of action of pyroxasulfone and metolachlor is similar, and it has the characteristics of high activity and low dosage, which is in line with the future development direction of pesticides. At the same time, existing data indicates that pyroxasulfone has no endocrine disrupting effect, and metolachlor was previously banned by the European Union for this reason. Therefore, in the future, pyroxasulfone will compete with metolachlor to seize market share. However, currently in China, only Shanghai Qunli Chemical Co., Ltd. has registered pyroxasulfone technical and suspension agents. The patent for pyroxasulfone compound expired on February 6, 2022, and the process patent is expected to expire after 2027. In the short term, metolachlor will still be the mainstream product of amide herbicides. Furthermore, increasingly strict environmental inspection in China puts greater pressure on metolachlor producers, since higher environmental costs must be taken into consideration.

Therefore, it's unlikely to see too much increase in the output of metolachlor in China in the following six years. In the first half of 2023, the output of metolachlor was relatively low. It is expected that the output in 2023 will be lower than in 2022, and then there will be a slight rebound in 2024. From 2024 to 2026, output will continue to increase and reach a peak of 14,500 tonnes in 2026. Then output will begin to decline in 2027.

Figure 6-1 Forecast on output of metolachlor technical in China, 2023–2028, tonne



Source: CCM

- Demand

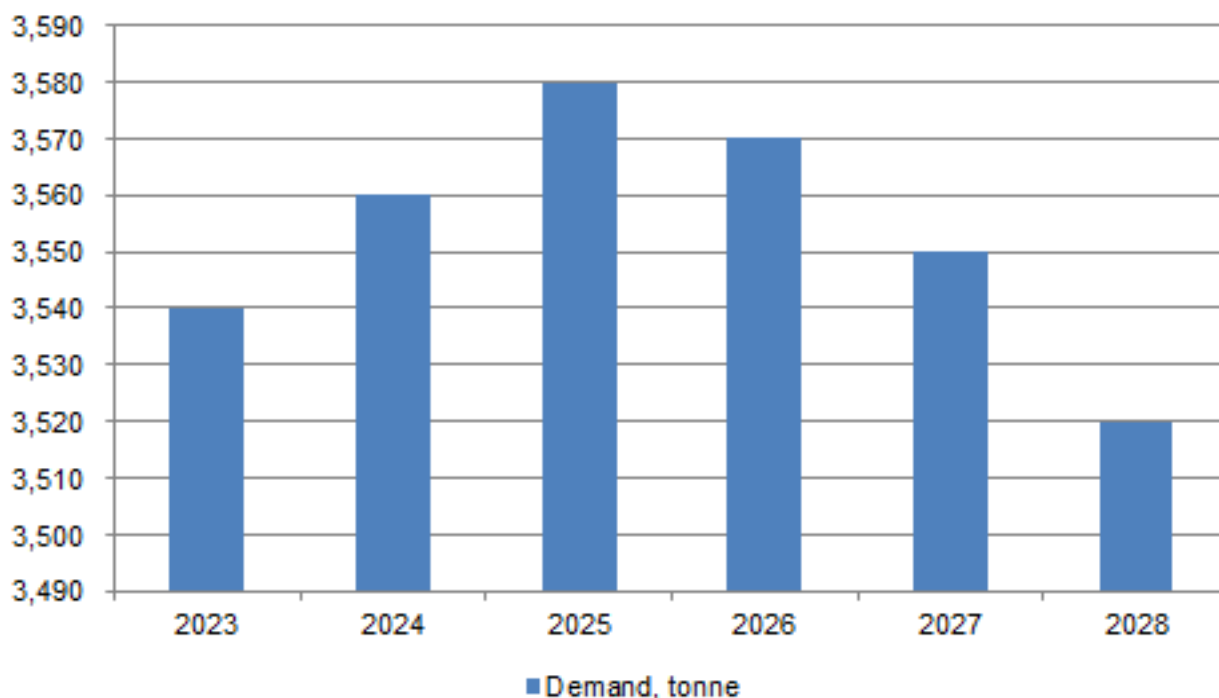
It's estimated that consumption of metolachlor technical in China will enjoy a slight increase in 2023–2025 with more metolachlor being applied on crops as a substitute for acetochlor. But domestic demand for metolachlor technical may decrease in 2026–2028.

With the release of the No. 1 central document of the Central Government this year, which requires increasing the planting of soybean and oil plants and vigorously promoting the composite planting of soybean and corn, the area of corn soybean composite planting will further increase in the future. Therefore, the demand for metolachlor is expected to increase in the future. In late Jan., 2023, a press conference on the work of China's agricultural and rural economy for 2022 was held by the State Council, which pointed out in 2023, soybean planting is targeted to be expanded by more than 666,667 ha, ensuring a total cropping area of over 23.3 million ha. That brings good news to metolachlor consumption and will promote domestic demand at least in the near future.

However, it's believed that it's unlikely to see a large increase in metolachlor consumption in China. On the one hand, the ultimate goal of expanding the planting area of corn and soybeans is to expand production and ensure food security. But the planting area cannot continue to expand, and future policies may focus on how to improve yield. On the other hand, in Nov. 2022, China released the Action Plan for the Amount Reduction of Chemical Pesticides by 2025, setting the target that by 2025 the chemical pesticide use for major food crops such as rice, wheat and corn will reduce by 5% respectively, compared with the 13th Five-Year Plan period (2016–2020). It is expected that the demand for metolachlor in China will gradually decline in future.

Besides, S-metolachlor is a strong competitive product of metolachlor. The more S-metolachlor will be used in crops, the less metolachlor will be needed in China. S-metolachlor is a selective herbicide with a broad weeding spectrum, sharing a similar herbicidal mechanism, application fields and application methods with metolachlor. It's deemed as an upgrade of metolachlor for its higher herbicidal activity and lower toxicity. In recent years, the S-metolachlor industry has been expanding in China, which can be reflected by the number of registrants. According to the ICAMA, there were only eight registrations of S-metolachlor (three for technical) in 2013, while the figure increased to 85 (24 for technical) as of Sept. 2023. And it's worth noting that even for those potential producers of metolachlor, they expressed that they would not launch their metolachlor production lines immediately and would act according to actual needs. Moreover, they expressed that they preferred to have production lines of S-metolachlor at the same time.

Figure 6-2 Forecast on demand for metolachlor technical in China, 2023–2028, tonne



Source: CCM

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