

Atrazine Market and Production in China

The Eighth Edition

May 2022

Researched & Prepared by:

Kcomber Inc.

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Contents

Executive Summary	1
Introduction & methodology	2
1 Overview of atrazine industry in China	4
1.1 Brief introduction to pesticide industry in China	4
1.2 Position of atrazine in Chinese herbicide industry	5
2 Registration of atrazine in China	6
3 Supply of atrazine in China, 2018–2021	9
3.1 Summary of atrazine technical production.....	9
3.2 Key atrazine technical manufacturers.....	10
4 Circulation of atrazine in China	12
4.1 Price of atrazine in China, 2021	12
4.2 Import and export of atrazine, 2018–2021	14
4.2.1 Circulation status of atrazine in 2021	14
4.2.2 Circulation status, 2018–2020	19
5 Consumption of atrazine in China, 2018–2021	31
6 Competing products of atrazine in China	32
7 Conclusions & trend	33

LIST OF TABLES

Table 1.1-1 China's imports and exports of pesticides and herbicides, 2017–2020
Table 2-1 Annual new registrations of atrazine in China, as of 15 March, 2022
Table 2-2 Registrations of atrazine technical in China, as of 15 March, 2022
Table 2-3 Registrations of atrazine formulations in China, as of 15 March, 2022
Table 3.2-1 Capacity and output of major atrazine technical producers in China, 2018–2021
Table 4.2.1-1 China's exports of atrazine by month, 2021
Table 4.2.1-2 China's exports of atrazine by destination in 2021, tonne
Table 4.2.1-3 China's exports of atrazine by exporter in 2021, tonne
Table 4.2.1-4 China's exports of atrazine by manufacturer in 2021, tonne
Table 4.2.2-1 China's exports of atrazine by month, 2020
Table 4.2.2-2 China's exports of atrazine by month, 2019
Table 4.2.2-3 China's exports of atrazine by month, 2018
Table 4.2.2-4 China's exports of atrazine by destination in 2020, tonne
Table 4.2.2-5 China's exports of atrazine by destination in 2019, tonne
Table 4.2.2-6 China's exports of atrazine by destination in 2018, tonne
Table 4.2.2-7 China's exports of atrazine by exporter in 2020, tonne
Table 4.2.2-8 China's exports of atrazine by exporter in 2019, tonne
Table 4.2.2-9 China's exports of atrazine by exporter in 2018, tonne
Table 4.2.2-10 China's exports of atrazine by manufacturer in 2020, tonne
Table 4.2.2-11 China's exports of atrazine by manufacturer in 2019, tonne
Table 4.2.2-12 China's exports of atrazine by manufacturer in 2018, tonne
Table 5-1 Apparent consumption of atrazine (converted to 100% technical) in China in 2018–2021, tonne
Table 5-2 Actual consumption volume of major atrazine formulations in China in 2019–2021, tonne

Table 6-1 Comparison among atrazine, 2,4-D and acetochlor in China, 2021

Table 6-2 Information of emerging competing herbicides applied on corn

LIST OF FIGURES

Figure 1.1-1 Output and share of herbicides in China's pesticide industry, 2016–2020

Figure 1.2-1 Output share of atrazine in herbicides industry in China, 2016–2020

Figure 3.1-1 Capacity and output of atrazine technical in China, 2018–2021

Figure 3.1-2 Distribution of capacity of atrazine technical in China by region, 2021

Figure 3.1-3 Distribution of output of atrazine technical in China by region, 2021

Figure 4.1-1 Annual ex-works prices of atrazine technical and cyanuric chloride in China, 2018–2021

Figure 4.1-2 Monthly ex-works price of 97% atrazine technical in China, Jan. 2019–Dec. 2021

Figure 4.1-3 Monthly ex-works price of atrazine 50% SC in China, Jan. 2019–Dec. 2021

Figure 4.1-4 Monthly ex-works price of cyanuric chloride (99.3%) in China, Jan. 2019–Dec. 2021

Figure 5-1 Actual consumption structure of atrazine formulations (converted to 100% technical) by crop in China, 2019–2021, tonne

Executive Summary

Atrazine, a triazine herbicide, is widely used worldwide, due to its good herbicidal effect, safety to crops and cost-effectiveness. China is not only a big atrazine consumer, but also a key supplier.

- Production

During 2020–2021, the capacity of atrazine technical remained at 140,000 t/a. The output of atrazine technical recovered in 2020, but dropped slightly in 2021. The output was about 78,200 tonnes in 2021, up by 15.17% compared with that in 2019.

- Import & export

China's atrazine is export-oriented. Export volume of atrazine technical and formulations (converted to 100% technical) usually takes large proportion to the domestic annual output; the figure was some 80% in 2020–2021. In 2021, the export volume of atrazine (converted to 100% technical) in China was 62,196 tonnes, down by 5.62% year on year. And Brazil was the largest importer of China's atrazine products in 2019–2021.

- Price

The ex-work price of atrazine technical increased since H2 2020, resulting from higher cost of its intermediates like cyanuric chloride, ethylamine and isopropylamine. Along the journey to recovery, it first climbed quietly then shot up in late 2021. The annual average price in 2021 was about 54% higher than the 2020 average.

- Consumption

In 2021, the actual consumption volume of atrazine formulations in China had a big jump, in response to some 5% yearly expansion of corn-growing area. Atrazine 38% SC plays the dominant role in the market; its usage accounted for about 66% of the total domestic consumption in 2021.

Introduction & methodology

Atrazine Market and Production in China is CCM's eighth edition report on China's atrazine industry, finished in May 2022.

Methodology and source

Desk research

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. A lot of work has been done to compile and analyse the information obtained. When necessary, checks were made with Chinese market players regarding market information such as production, demand, and competition.

Telephone interviews

CCM carried out extensive telephone interviews with major participants in the industry chain of the products mentioned in this report throughout upstream to downstream.

The interviewees cover:

- Manufacturers
- Traders
- Industrial associations
- Local governments
- Researchers and experts
- Farmers

Data processing and presentation

The data collected and compiled are sourced from:

- Published articles from Chinese periodicals, magazines, and journals
- Government statistics & customs statistics
- Telephone interviews with Chinese manufacturers, traders, government and farmers
- Comments from industrial experts
- CCM's database
- Information from the Internet
- Third-party databases

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

Definition and glossary

In this report, atrazine technical refers to 97% atrazine technical (TC); atrazine formulations refer to atrazine 38% SC, atrazine 48% WP, atrazine 50% SC, atrazine 80% WP and atrazine 90% WDG; when "atrazine" is mentioned, it includes both atrazine technical and atrazine formulations.

Apparent consumption equals production + import - export, which is one of the factors reflecting demand. Assuming the inventory stays the same every year, the apparent consumption also equals to the actual consumption.

Unit

USD: US dollar, currency unit in the US

RMB: currency unit in China, also named Renminbi

Tonne: ton, equals to metric ton in this report

/t: per tonne

t/a: tonne per year, tonne/annum

Table 1 Main abbreviation and their full names in the report

Abbreviation	Full name
AI	Active ingredient
ICAMA	The Institute for the Control of Agrochemicals, Ministry of Agriculture and Rural Affairs
SC	Suspension concentrate
SE	Suspension emulsion
WDG	Water dispersible granule
WP	Wettable powder
AS	Aqueous solution
EC	Emulsifiable concentrate
OD	Oil dispersion
CAGR	Compound annual growth rate

Source: CCM

Table 2 USD/CNY exchange rate, Jan. 2016–Dec. 2021

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

Source: The People's Bank of China

1 Overview of atrazine industry in China

1.1 Brief introduction to pesticide industry in China

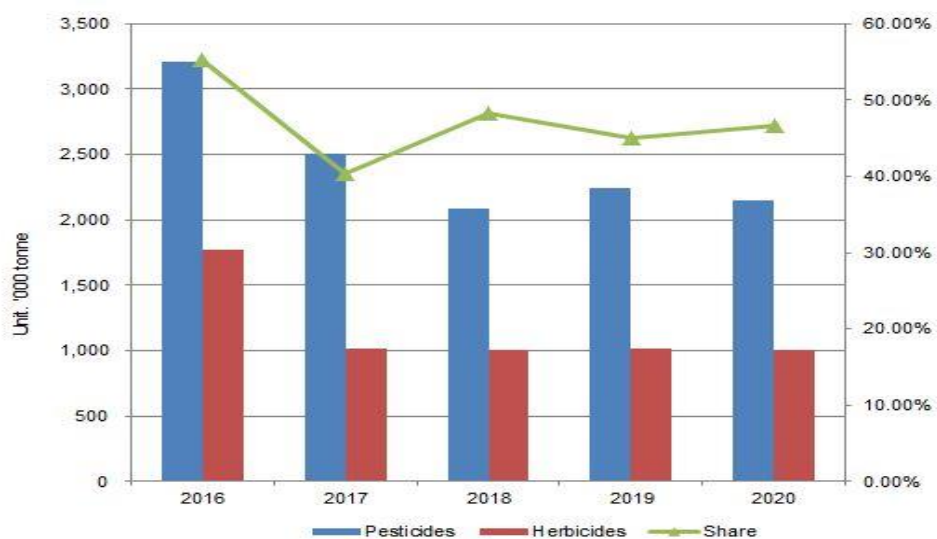
- Supply and demand

China is now the world's largest exporter of pesticides, and herbicides is an important pesticide category. In recent years, amid the rising labor cost and 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 destruction of ecological environment and soil fertility. Therefore, with multiple environmental protection policies rolled out, the output of herbicides in China showed a general downward trend in recent years. In 2020, China's herbicide output was 1,004,000 tonnes (converted to 100% technical, the same hereinafter), decreasing by 0.69% year on year.

In terms of export of pesticides from China, in 2020, altogether 2,514,000 tonnes of pesticides were exported at a total value of USD7,624 million. Specifically, 1,236,000 tonnes of herbicides were exported at a total value of USD3,069 million, up by 24.60% and 13.04% year on year, respectively. However, the export volume of herbicides took up less than 50% of the total export volume this year, down from over 65% in 2019.

Along with structural adjustment of the pesticide industry and development of products with higher added value and efficacy, structure of pesticide output in China has improved. Notably, China's output proportion of herbicides showed a general uptrend in 2017–2020. In 2020, China's output proportion of herbicides (by 100% technical) was around 46.74%, herbicides still being the largest pesticide category.

Figure 1.1-1 Output and share of herbicides in China's pesticide industry, 2016–2020



Note: All the volumes are calculated by 100% technical.

Source: National Bureau of Statistics of China

- Import and export

Table 1.1-1 China's imports and exports of pesticides and herbicides, 2017–2020

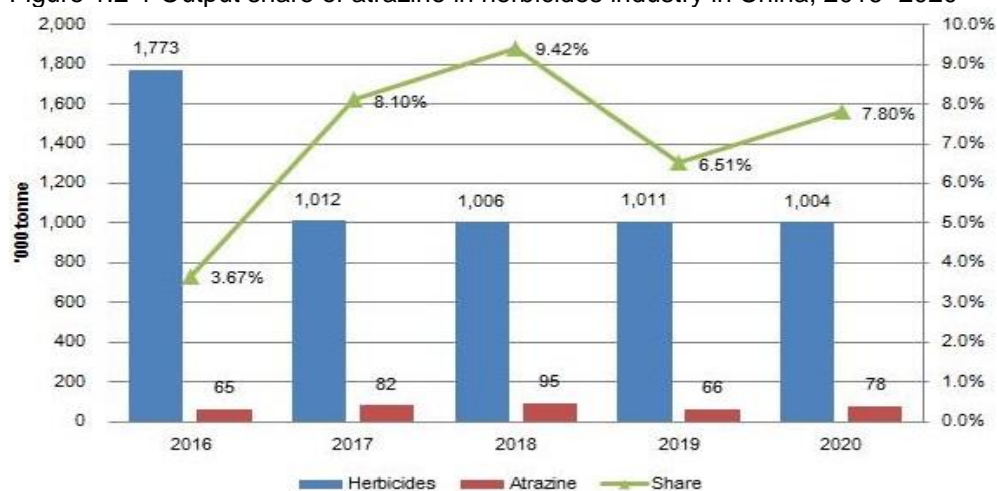
Year	Pesticides				Herbicides				Share of herbicides/pesticides			
	Import		Export		Import		Export		Import		Export	
	Volume, tonne	Value, million USD	Volume, tonne	Value, million USD	Volume, tonne	Value, million USD	Volume, tonne	Value, million USD	Volume	Value	Volume	Value
2017	83,000	680	1,632,000	6,760	22,000	129	1,135,000	3,679	26.51%	18.97%	69.55%	54.42%
2018	79,000	489	1,405,400	8,073	23,000	149	989,900	4,355	29.11%	30.47%	70.44%	53.95%
2019	90,000	762	1,468,000	4,860	14,000	100	992,000	2,715	15.56%	13.12%	67.57%	55.86%
2020	110,000	911	2,514,000	7,624	14,000	78	1,236,000	3,069	12.73%	8.56%	49.16%	40.25%

Source: National Bureau of Statistics of China

1.2 Position of atrazine in Chinese herbicide industry

Atrazine is a herbicide largely produced in China and foreign countries. It is mainly used to control the growth of weed in corn and sugarcane fields. It is popular amongst farmers for its wide range of application, safety to crops, good compatibility with other pesticides, and high cost-effectiveness. However, atrazine has disadvantages including long residual efficacy and injury to some rotated crops such as soybean, wheat and rice.

Figure 1.2-1 Output share of atrazine in herbicides industry in China, 2016–2020



Note: The data above are calculated by 100% technical.
Source: The National Bureau of Statistics of China & CCM

2 Registration of atrazine in China

Atrazine is mainly registered to control weeds in the fields of corn, sugarcane, sorghum, tea and fruit in China.

As of 15 March, 2022, there were 1,028 registrations of atrazine in China, of which 177 were single formulations (technical products excluded) and 825 mixed formulations. Registrations of atrazine technical were held by 26 companies. There were some registrants that held at least 20 atrazine-related registrations, such as Shoujian Technology Co., Ltd. (previously Qiaochang Modern Agriculture Co., Ltd.), Jilin Jinze Pesticide Co., Ltd. (previously Jilin Jinqiu Pesticide Co., Ltd.), Liaoning Sanzheng Chemical Co., Ltd., Shandong Aokun Crop Science Co., Ltd., and Shandong Binnong Technology Co., Ltd.

Table 2-1 Annual new registrations of atrazine in China, as of 15 March, 2022

Year	Technical	Formulation	Total
Before 2015	21	460	481
2015	0	107	107
2016	1	80	81
2017	4	151	155
2018	0	137	137
2019	0	0	0
2020	0	13	13
2021	0	53	53
2022	0	1	1
Total	26	1,002	1,028

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

Table 2-2 Registrations of atrazine technical in China, as of 15 March, 2022

No.	Registration code	Registrant	Registrant (CN)	Content	Expiry date
1	PD20171053	Inner Mongolia Miraculous Crop Science Co., Ltd.	内蒙古灵圣作物科技有限公司	98%	2022-5-31
2	PD20121068	Jingma Chemicals Co., Ltd.	捷马化工股份有限公司	97%	2022-7-12
3	PD20070230	Shandong Vicome Greenland Chemical Co., Ltd.	山东胜邦绿野化学有限公司	95%	2022-8-8
4	PD20172024	Ningxia Gerui Fine Chemical Co., Ltd.	宁夏格瑞精细化工有限公司	98%	2022-9-18
5	PD20171964	Xiangshui Zhongshan Biological Technology Co., Ltd.	响水中山生物科技有限公司	97%	2022-9-18
6	PD20070654	Liaoning Tianyi Pesticide Chemical Co., Ltd.	辽宁天一农药化工有限责任公司	97%	2022-12-17
7	PD20080224	Shandong Weifang Rainbow Chemical Co., Ltd.	山东潍坊润丰化工股份有限公司	98%	2023-1-11
8	PD20080517	Nanjing Huazhou Pharmaceutical Co., Ltd.	南京华洲药业有限公司	96%	2023-4-29

No.	Registration code	Registrant	Registrant (CN)	Content	Expiry date
9	PD93105	Jilin Lvsheng Agrochemical Co., Ltd.	吉林市绿盛农药化工有限公司	92%	2023-5-27
10	PD20080805	Zhejiang Zhongshan Chemical Industry Group Co., Ltd.	浙江中山化工集团股份有限公司	95%	2023-6-20
11	PD93105-2	Zhejiang Changxing First Chemical Co., Ltd.	浙江省长兴第一化工有限公司	97%	2023-6-26
12	PD93105-3	Hebei Xuanhua Pesticide Co., Ltd.	河北宣化农药有限责任公司	92%, 88%, 85%	2023-6-3
13	PD20080706	Zhanhua Guochang Fine Chemical Co., Ltd.	沾化国昌精细化工有限公司	98%	2023-6-4
14	PD20081023	Shoujian Technology Co., Ltd.	首建科技有限公司	98%	2023-8-6
15	PD20081892	Syngenta AG	瑞士先正达作物保护有限公司	96%	2023-11-20
16	PD20082125	Henan Bo'ai Huifeng Biochemical Pesticide Co., Ltd.	博爱惠丰生化农药有限公司	97%	2023-11-25
17	PD20081482	Jilin Jinze Pesticide Co., Ltd.	吉林金泽农药有限公司	92%	2023-11-4
18	PD20085579	Jiangsu Tianrong Group Co., Ltd.	江苏天容集团股份有限公司	97%	2023-12-25
19	PD20091306	Shandong Dacheng Biochemical Co., Ltd.	山东大成生物化工有限公司	95%	2024-2-1
20	PD20093639	Shandong Dehao Chemical Co., Ltd.	山东德浩化学有限公司	97%	2024-3-25
21	PD20094227	Guangxi Research Institute of Chemical Industry Co., Ltd.	广西化工研究院有限公司	95%	2024-3-31
22	PD20094984	Liaoning Sanzheng Chemical Co., Ltd.	辽宁三征化学有限公司	96%	2024-4-21
23	PD20096276	Anhui Zhongshan Chemical Co., Ltd.	安徽中山化工有限公司	97%	2024-7-22
24	PD20097438	Shandong Eshung Industrial Co., Ltd.	山东亿盛实业股份有限公司	95%	2024-10-29
25	PD20160978	Hebei Lingang Chemical Co., Ltd.	河北临港化工有限公司	95%	2026-8-1
26	PD20170559	Weihai Hanfu Biochemical Medicine Co., Ltd.	威海韩孚生化药业有限公司	98%	2027-4-9

Source: ICAMA & CCM

Table 2-3 Registrations of atrazine formulations in China, as of 15 March, 2022

Item	Content	Number
Single formulation	SC	99
	WG	36
	WP	35
	OD	7
	Sub-total	177
Mixed formulation	Nicosulfuron•Atrazine	162
	Mesotrione•Atrazine	129
	Nicosulfuron•Mesotrione•Atrazine	92
	Propisochlor•Atrazine	64
	Acetochlor•Atrazine	44
	Others	334
	Sub-total	825
Total		1,002

Source: ICAMA & CCM

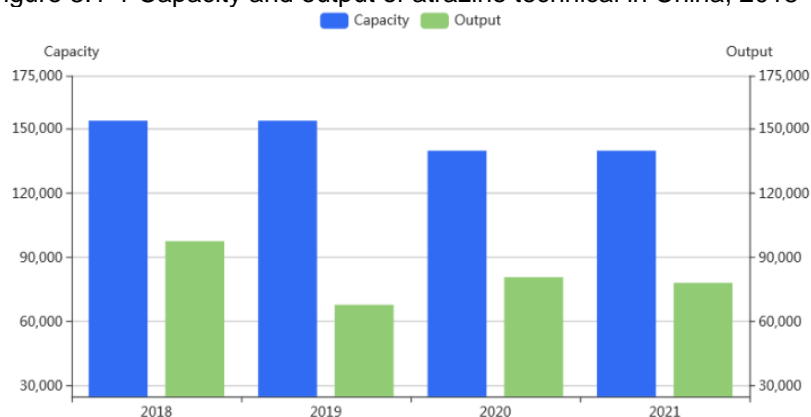
3 Supply of atrazine in China, 2018–2021

3.1 Summary of atrazine technical production

During 2020–2021, the capacity of atrazine technical remained at 140,000 t/a in China. As to the output of atrazine technical, it fluctuated—recovered greatly in 2020, but dropped slightly in 2021. Due to strong overseas demand, domestic atrazine output surged with a yearly increase of 19.15% in 2020. In 2021, the output was about 78,200 tonnes, still 15.17% higher than that in 2019. Restriction on pesticide production in East China in Q4 led to the slight drop.

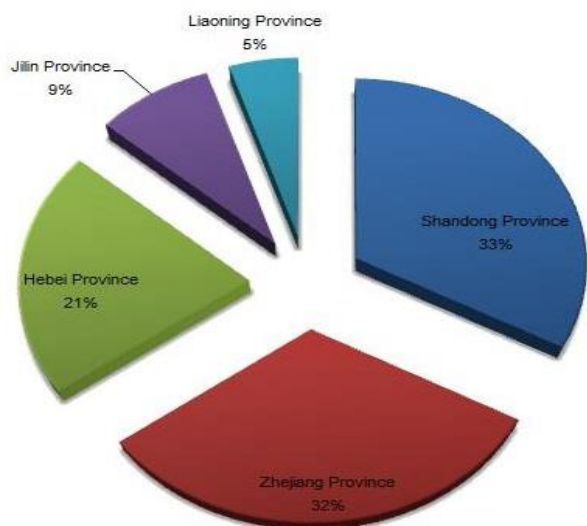
Atrazine technical production is highly concentrated in East China and North China. At least 65% of atrazine capacity and output was concentrated in Shandong and Zhejiang provinces in 2021; the output from regions beyond Zhejiang, Shandong and Hebei made up only some 4% of the total. Besides, the top three atrazine technical producers (by output) contributed around 67% to the domestic total.

Figure 3.1-1 Capacity and output of atrazine technical in China, 2018–2021



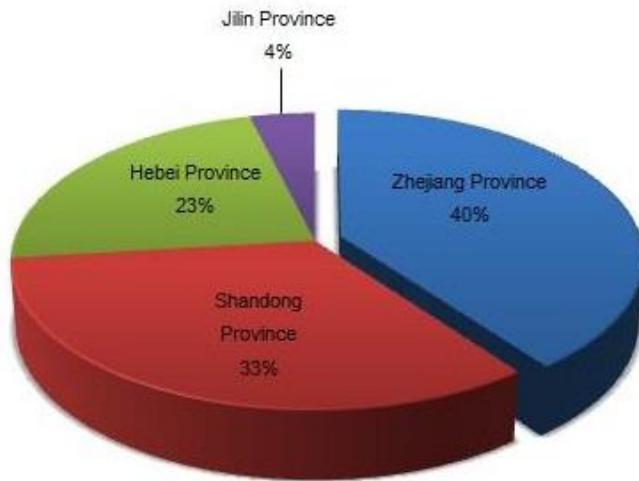
Source: CCM

Figure 3.1-2 Distribution of capacity of atrazine technical in China by region, 2021



Source: CCM

Figure 3.1-3 Distribution of output of atrazine technical in China by region, 2021



Note: It is based on major producers' output of atrazine technical only.
Source: CCM

3.2 Key atrazine technical manufacturers

In 2021, there were mainly 9 companies engaged in the production of atrazine technical in China.

Zhejiang Zhongshan Chemical Industry Group Co., Ltd. and Hebei Lingang Chemical Co., Ltd. maintained the capacity at 30,000 t/a for years; the two produced more than half of the total atrazine technical in China in 2021.

Table 3.2-1 Capacity and output of major atrazine technical producers in China, 2018–2021

No.	Producer	Abbreviation	Location	Status, as of the end of 2021	2021		2020		2019		2018	
					Capacity, t/a	Output, tonne	Capacity, t/a	Output, tonne	Capacity, t/a	Output, tonne	Capacity, t/a	Output, tonne
1	Zhejiang Zhongshan Chemical Industry Group Co., Ltd.	Zhejiang Zhongshan	Zhejiang	Active	30,000	25,400	30,000	27,800	30,000	28,500	30,000	28,000
2	Hebei Lingang Chemical Co., Ltd. (previously Hebei Shanli Chemical Co., Ltd.)	Hebei Lingang	Hebei	Active	30,000	17,900	30,000	19,000	30,000	21,000	30,000	23,000
3	Zhejiang Province Changxing First Chemical Co., Ltd.	Zhejiang Changxing	Zhejiang	Active	15,000	5,700	15,000	6,900	15,000	0	15,000	13,000
4	Shandong Qiaochang Chemical Co., Ltd.	Zhanhua Guochang	Shandong	Active	15,000	3,500	15,000	2,200	15,000	500	15,000	8,000
5	Shandong Weifang Rainbow Chemical Co., Ltd.	Weifang Rainbow	Shandong	Active	12,000	4,900	12,000	3,200	10,000	6,000	10,000	700
6	Jilin Jinze Pesticide Co., Ltd. (previously Jilin Jinqiu Pesticide Co., Ltd.)	Jilin Jinze	Jilin	Active	12,000	3,100	12,000	4,600	12,000	0	12,000	0
7	Shandong Kesai Agrochem Biotechnology Co., Ltd.	Shandong Kesai	Shandong	Active	10,000	9,200	10,000	8,900	10,000	1,800	10,000	4,000
8	Shandong Binnong Technology Co., Ltd.	Shandong Binnong	Shandong	Active	9,000	8,500	9,000	8,300	15,000	10,000	15,000	10,000
9	Liaoning Tianyi Pesticide Chemical Co., Ltd.	Liaoning Tianyi	Liaoning	Idle	7,000	0	7,000	0	7,000	0	7,000	4,000
10	Shandong Vicome Greenland Chemical Co., Ltd.	Shandong Vicome	Shandong	Stopped	0	0	0	0	10,000	100	10,000	7,000
Total					140,000	78,200	140,000	80,900	154,000	67,900	154,000	97,700

Source: CCM

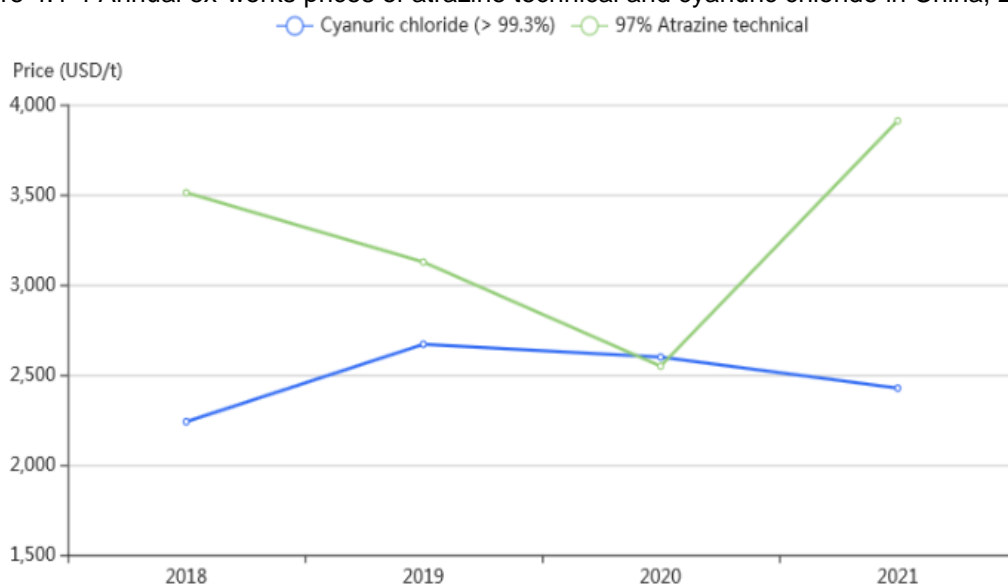
4 Circulation of atrazine in China

4.1 Price of atrazine in China, 2021

During 2018–H1 2020, the ex-works price of atrazine technical in China showed a general downward trend, though the price of its key raw material—cyanuric chloride stayed quite high. Large atrazine inventory led to the fall. Since H2 2020, the price started the journey to recovery, first at slow pace, but then in late 2021 shooting up upon the power shortage and production restriction. The year 2021 also witnessed price increases of its intermediates like cyanuric chloride, ethylamine and isopropylamine. The annual average ex-works price of 97% atrazine technical in 2021 grew by 53.45% year on year.

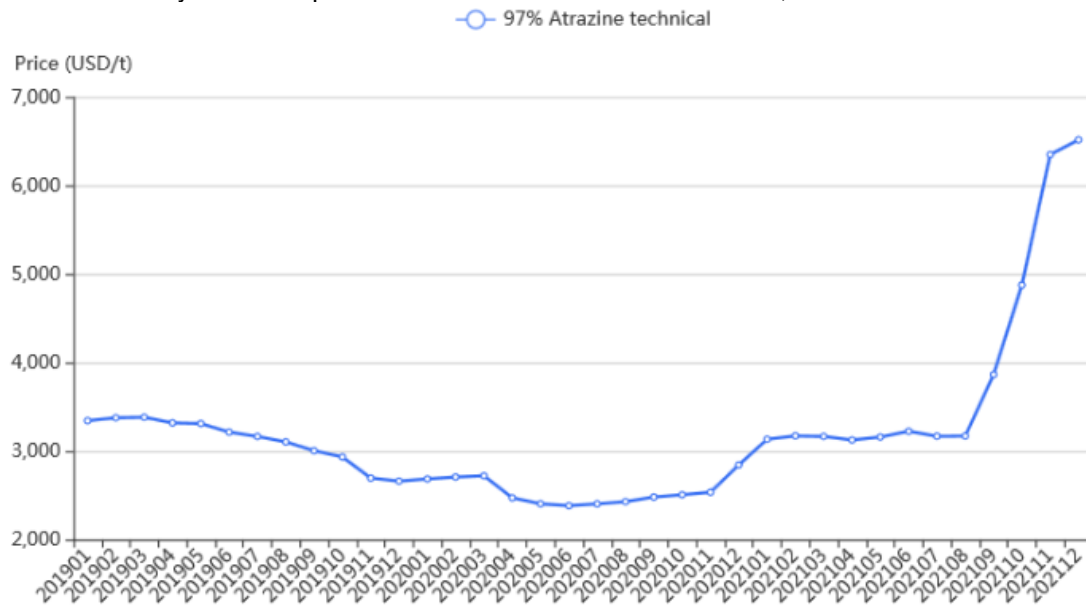
In 2021, monthly ex-works price of 97% atrazine technical fluctuated around USD3,150/t from Jan. to Aug. From Sept. onwards, it jumped quickly and landed at USD6,516/t in Dec.—an increase of 105.55% from the Aug. price and up by 129.08% year on year. Regarding atrazine 50% SC, its monthly ex-works price in China hovered around USD1,950/t before Sept. and climbed to USD4,051/t in Dec., which is 128.23% higher from a year earlier.

Figure 4.1-1 Annual ex-works prices of atrazine technical and cyanuric chloride in China, 2018–2021



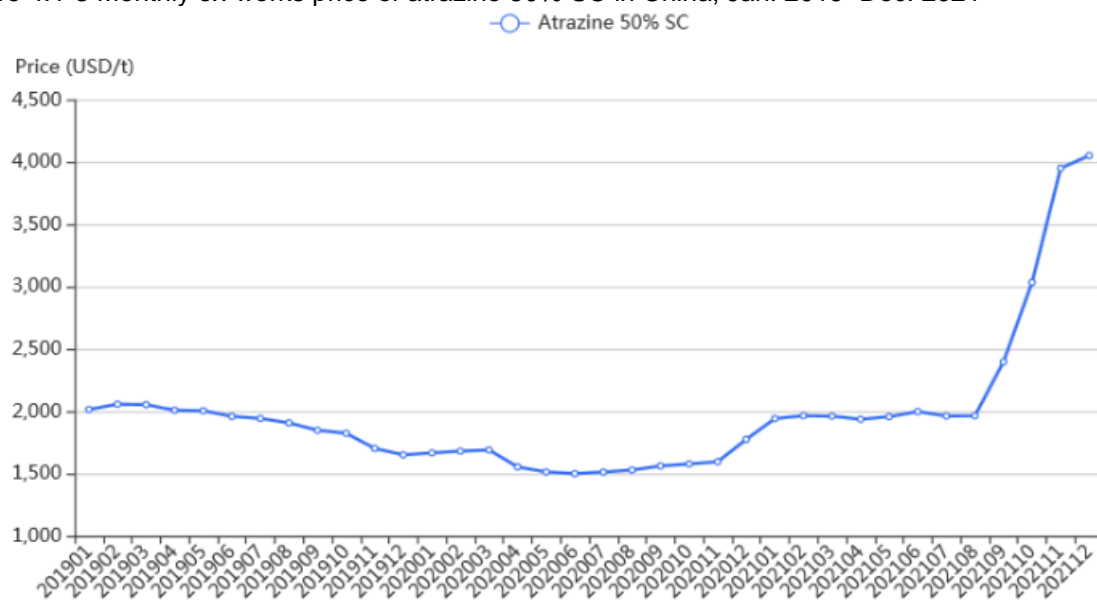
Source: CCM

Figure 4.1-2 Monthly ex-works price of 97% atrazine technical in China, Jan. 2019–Dec. 2021



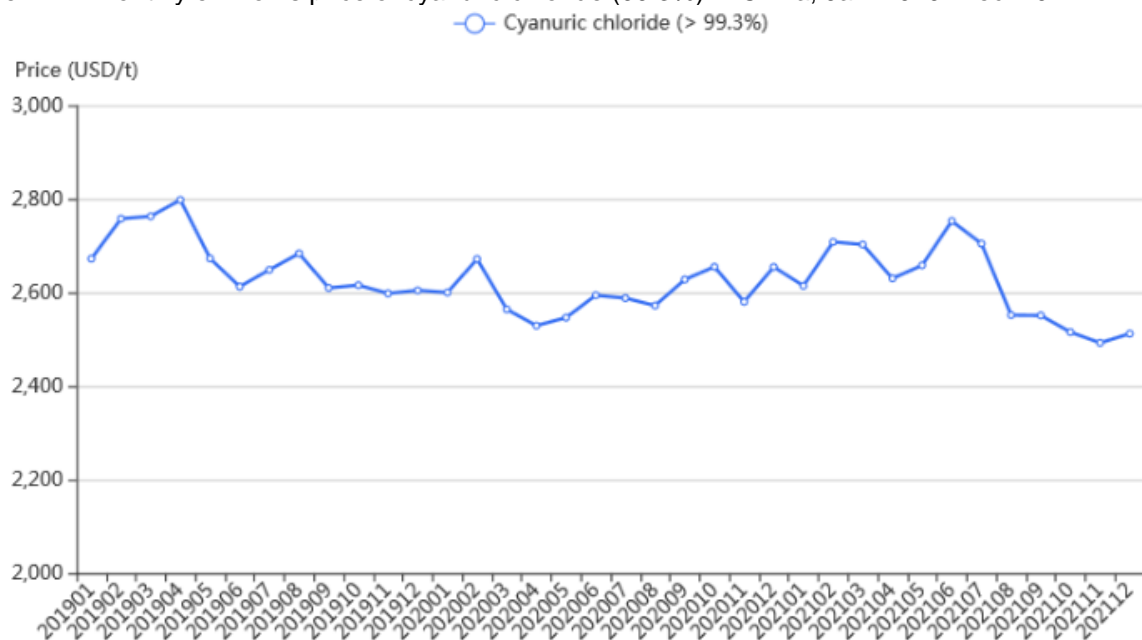
Source: CCM

Figure 4.1-3 Monthly ex-works price of atrazine 50% SC in China, Jan. 2019–Dec. 2021



Source: CCM

Figure 4.1-4 Monthly ex-works price of cyanuric chloride (99.3%) in China, Jan. 2019–Dec. 2021



Source: CCM

4.2 Import and export of atrazine, 2018–2021

4.2.1 Circulation status of atrazine in 2021

With abundant supply, China imports small quantity of atrazine products. In fact, China is a big atrazine exporter, with annual export volume of atrazine technical and formulations (converted to 100% technical, the same below) accounting for about 70% of domestic output since 2008, except a less-than-60% in 2018 resulting from sluggish overseas demand. In 2020 and 2021, the share was over 80%.

According to monitoring import and export data from Tranalysis, the export volume of atrazine products in China in 2021 was some 62,200 tonnes, down about 6% from the 65,900 tonnes in 2020. Export of atrazine technical achieved the best performance in March, but it fell sharply in the following three months. The Oct. export volume of atrazine experienced a 43.85% year-on-year slide before the peak season of overseas sales. Slower export in Q4 may be linked with a skyrocketing ex-works price since Sept., affected by low operating rate in China. Notably, the ratio of technical product export to total export in Oct.–Dec. jumped to 93%, 99% and 100%, respectively.

Main specifications of atrazine products for export in 2021 were 97% technical, 95% technical, 50% SC, 80% WP and 90% WDG. The export volume of atrazine technical products was 51,163 tonnes, with a yearly increase of 2.32% and accounting for over 82% of the total export.

Brazil, the US, Argentina and India were four major export destinations in 2021, accounting for about 76% of China's total export volume. Brazil imported nearly 18,300 tonnes of atrazine products from China, some 30% of the total, and the US and Argentina imported about 11,000 tonnes, nearly 18% of the total each.

The top three exporters were Zhejiang Zhongshan Chemical Industry Group Co., Ltd., Hebei Lingang Chemical Co., Ltd. and Shandong Kesai Agrochem Biotechnology Co., Ltd.; the three, plus their subsidiaries, contributed to almost 52% of the total export. They are also major atrazine technical manufacturers.

Table 4.2.1-1 China's exports of atrazine by month, 2021

Month	38% SC	50% SC	80% WP	90% WDG	95% Tech.	97% Tech.	98% Tech.	Total volume (converted to 100% technical, tonne)
January	0.000	1,669.953	697.492	419.692	901.500	3,457.466	194.000	6,104.182
February	17.873	776.604	674.660	456.418	873.500	2,660.300	642.000	5,353.831
March	8.000	183.050	1,015.824	348.288	2,455.000	3,222.422	426.000	7,088.761
April	0.000	879.552	1,594.542	488.788	715.000	1,505.000	562.000	4,809.997
May	0.000	138.134	318.330	312.120	108.000	1,595.100	193.000	2,438.100
June	0.000	90.359	361.067	258.321	25.000	1,374.300	9.000	1,928.549
July	0.000	802.860	306.910	343.800	0.000	5,531.645	225.000	6,510.460
August	45.335	177.103	89.270	1,203.850	94.920	4,111.682	1,380.200	6,684.224
September	17.700	518.200	48.000	807.023	226.842	5,073.200	0.000	6,146.145
October	0.000	23.046	43.500	274.300	105.073	3,922.607	0.000	4,197.018
November	0.000	11.000	44.000	0.000	48.000	5,821.503	0.000	5,732.718
December	0.000	0.000	0.000	0.000	402.880	4,968.129	0.000	5,201.821
Total	88.908	5,269.861	5,193.595	4,912.600	5,955.714	43,243.354	3,631.200	62,195.807

Source: Tranalysis

Table 4.2.1-2 China's exports of atrazine by destination in 2021, tonne

No.	Destination	38% SC	50% SC	80% WP	90% WDG	95% Tech.	97% Tech.	98% Tech.	Total volume (converted to 100% technical)
1	Brazil	0.000	65.200	0.000	1,072.840	0.000	16,236.000	1,555.200	18,268.564
2	The US	0.000	785.615	0.000	0.000	947.714	10,170.238	0.000	11,126.843
3	Argentina	0.000	0.000	91.200	704.010	0.000	10,551.253	0.000	10,941.284
4	India	0.000	0.000	0.000	0.000	3,505.000	2,370.000	1,300.000	6,902.650
5	Pakistan	8.000	0.000	23.000	0.000	1,222.000	902.200	712.000	2,755.154
6	Nigeria	0.000	114.250	2,381.103	420.336	0.000	0.000	0.000	2,335.740
7	Mexico	0.000	114.912	1,045.005	866.163	0.000	443.000	0.000	2,098.120
8	Canada	0.000	0.000	0.000	0.000	0.000	1,922.466	0.000	1,864.792
9	Chile	0.000	1,731.680	0.000	211.118	0.000	261.872	0.000	1,240.595
10	Ghana	0.000	546.962	1,078.290	0.000	0.000	0.000	0.000	1,114.235
11	Australia	0.000	482.216	0.000	710.058	0.000	0.000	0.000	860.872
12	Vietnam	0.000	12.600	410.925	0.000	0.000	251.725	0.000	578.709
13	Paraguay	0.000	16.240	0.000	420.165	84.000	61.600	0.000	525.171
14	Tanzania	0.000	722.350	0.000	0.000	0.000	0.000	0.000	332.281
15	Ecuador	0.000	0.000	11.052	255.534	0.000	3.000	0.000	241.732
	Others	80.908	677.836	153.020	252.376	197.000	70.000	64.000	1,009.065
	Total	88.908	5,269.861	5,193.595	4,912.600	5,955.714	43,243.354	3,631.200	62,195.807

Note: Nuances in some data are mainly caused by rounding principle.

Source: Tranalysis

Table 4.2.1-3 China's exports of atrazine by exporter in 2021, tonne

No.	Exporter	38% SC	50% SC	80% WP	90% WDG	95% Tech.	97% Tech.	98% Tech.	Total volume (converted to 100% technical)
1	Zhejiang Zhongshan Chemical Industry Group Co., Ltd.	0.000	300.000	360.780	322.350	1,804.000	13,052.947	0.000	15,091.897
2	Hebei Lingang Chemical Co., Ltd.	0.000	0.000	0.000	0.000	2,404.714	9,794.028	0.000	11,784.686
3	Shandong Kesai Agrochem Biotechnology Co., Ltd.	63.208	30.256	301.140	0.000	0.000	5,334.000	0.000	5,452.197
4	Shandong Weifang Rainbow Chemical Co., Ltd.	0.000	301.492	995.391	1,795.271	0.000	504.500	1,373.200	4,385.844
5	CropScience Co., Ltd.	0.000	0.000	0.000	0.000	0.000	2,869.200	0.000	2,783.124
6	Kingland Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	1,922.466	0.000	1,864.792
7	Shandong Binnong Technology Co., Ltd.	0.000	179.464	294.925	43.200	0.000	86.000	635.000	1,063.093
8	S&W International Chemical Logistics Ltd.	0.000	0.000	0.000	0.000	0.000	954.000	0.000	925.380
9	Shanghai Psyche Chemicals Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	804.000	787.920
10	Shandong Qiaochang Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	700.000	686.000
11	Shandong Jiajia International Freight and Forwarding Co., Ltd.	0.000	459.170	0.000	311.234	0.000	0.000	0.000	491.329
12	DAI Co., Ltd.	0.000	0.000	0.000	0.000	0.000	506.000	0.000	490.820
13	Afri Ventures FZE	0.000	55.650	507.936	0.000	0.000	0.000	0.000	431.948
14	Agrohao Co., Ltd.	0.000	0.000	40.000	420.336	0.000	0.000	0.000	410.302
15	Nanjing Bodao Logistics Co., Ltd.	0.000	0.000	0.000	0.000	350.000	0.000	0.000	332.500
	Others	25.700	3,943.829	2,693.423	2,020.209	1,397.000	8,220.214	119.000	15,213.974
	Total	88.908	5,269.861	5,193.595	4,912.600	5,955.714	43,243.354	3,631.200	62,195.807

Source: Tranalysis

Table 4.2.1-4 China's exports of atrazine by manufacturer in 2021, tonne

No.	Manufacturer	38% SC	50% SC	80% WP	90% WDG	95% Tech.	97% Tech.	98% Tech.	Total volume (converted to 100% technical)
1	Zhejiang Zhongshan Chemical Industry Group Co., Ltd.	0.000	581.182	543.630	868.281	1,881.000	13,146.447	0.000	16,022.704
3	Hebei Lingang Chemical Co., Ltd.	0.000	3.300	40.000	0.000	2,704.714	9,189.708	0.000	11,517.013
8	Shandong Kesai Agrochem Biotechnology Co., Ltd.	63.208	44.300	319.140	0.000	40.000	8,220.200	0.000	8,310.671
2	Shandong Weifang Rainbow Chemical Co., Ltd.	0.000	301.492	995.391	1,997.681	0.000	504.500	1,373.200	4,568.013
4	Shandong Binnong Technology Co., Ltd.	0.000	197.089	312.925	43.200	0.000	109.100	1,335.000	1,794.008
5	Jiangsu Lulilai Co., Ltd.	0.000	0.000	69.520	0.000	521.000	60.000	0.000	608.766
6	Shandong Vicome Greenland Chemical Co., Ltd.	0.000	0.000	11.000	0.000	300.000	0.000	0.000	293.800
7	Lianyungang Liben Crop Science and Technology Co., Ltd.	0.000	0.000	38.000	0.000	0.000	0.000	0.000	30.400
9	Zhejiang Province Changxing First Chemical Co., Ltd.	0.000	36.000	0.000	0.000	0.000	0.000	0.000	16.560
	Others	25.700	4,106.498	2,863.989	2,003.438	509.000	12,013.400	923.000	19,033.871
	Total	88.908	5,269.861	5,193.595	4,912.600	5,955.714	43,243.354	3,631.200	62,195.807

Note: Nuances in some data are mainly caused by rounding principle.

Source: Tranalysis

4.2.2 Circulation status, 2018–2020

By month

Table 4.2.2-1 China's exports of atrazine by month, 2020

Month	38% SC		48% WP		50% SC		80% WP		90% WDG		95% Tech.		97% Tech.		98% Tech.		Total volume (converted to 100% technical, tonne)	Value (million USD)
	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)		
January	53.920	2.59	0.000	/	920.186	2.06	1,386.596	2.85	1,543.278	3.43	3,800.000	2.84	76.500	2.70	809.000	2.51	7,455.835	24
February	0.000	/	0.000	/	328.305	2.02	976.280	2.96	501.564	3.55	1,808.000	2.80	300.000	2.62	286.500	2.59	3,685.954	12
March	61.280	2.31	0.000	/	516.926	2.35	1,699.282	2.83	1,703.241	3.51	2,798.500	2.64	341.500	2.66	747.650	2.52	6896.619	22
April	81.988	2.53	3.100	2.37	422.107	2.27	513.886	2.87	1,326.658	3.58	1,939.525	2.71	335.000	2.44	183.000	2.53	4,177.933	14
May	16.000	1.45	0.000	/	13.574	2.65	94.000	2.44	896.800	3.30	634.000	2.19	1972.900	2.82	444.505	2.16	3,846.112	11
June	11.000	1.76	0.000	/	23.431	2.15	22.000	1.30	559.279	3.55	191.000	2.17	2907.659	2.63	341.000	2.36	3,871.858	11
July	38.808	1.62	0.000	/	71.663	2.21	287.680	1.91	240.000	3.33	852.290	2.19	3931.789	2.89	726.000	2.31	5,828.459	16
August	0.000	/	0.000	/	91.300	1.72	113.400	2.74	18.000	3.04	795.500	2.20	2382.333	3.09	60.000	2.43	3,274.306	10
September	4.180	3.03	0.000	/	39.534	1.79	203.328	2.77	662.642	3.09	855.760	2.04	4795.600	2.69	1,587.007	2.34	7,798.743	21
October	0.000	/	0.000	/	22.603	4.56	76.000	2.31	745.000	3.23	2,956.740	2.43	3970.400	2.89	74.000	2.20	7,474.408	22
November	0.000	/	0.000	/	136.010	2.81	122.200	2.44	1,348.505	3.18	3,065.000	2.40	1,651.300	2.90	260.148	3.13	6,142.435	18
December	0.000	/	0.000	/	247.754	2.21	651.770	3.35	1,015.405	3.33	1,074.000	2.79	2804.800	2.76	157.500	2.55	5,444.553	17
Total	267.176	2.27	3.100	2.37	2,833.392	2.20	6,146.422	2.84	10,560.372	3.38	20,770.315	2.56	25,469.781	2.81	5,676.310	2.43	65,897.215	199

Source: Tranalysis

Table 4.2.2-2 China's exports of atrazine by month, 2019

Month	38% SC		48% SC		48% WP		50% SC		80% WP		90% WDG		95% Tech.		97% Tech.		98% Tech.		Total volume (converted to 100% technical, tonne)	Value (million USD)
	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)		
January	17.000	3.61	0.000	/	15.000	2.16	712.508	2.54	1,716.180	3.44	1,842.074	4.14	0.000	/	3,555.700	3.20	433.500	3.14	7,245.835	28
February	0.000	/	0.000	/	0.000	/	558.744	2.74	796.660	3.40	495.072	4.08	0.000	/	1,261.000	3.21	528.000	3.29	3,080.525	12
March	48.175	4.67	0.000	/	0.000	/	352.929	2.74	1,013.862	3.52	941.891	4.05	0.000	/	2,196.300	3.25	0.000	/	3,969.375	16
April	38.040	1.96	0.000	/	38.000	2.44	266.007	2.62	667.680	3.55	529.057	4.23	0.000	/	2,665.550	3.31	130.000	3.07	3,877.957	14
May	193.664	2.69	0.000	/	0.000	/	559.257	2.61	736.900	3.52	546.433	3.91	0.000	/	2,231.100	3.31	243.000	3.22	3,836.837	15
June	30.240	1.76	7.000	3.41	16.000	2.22	300.520	2.22	533.080	3.25	630.695	3.94	0.000	/	6,360.900	3.15	1,073.000	2.87	8,376.171	27
July	117.846	2.04	0.000	/	0.000	/	999.954	2.74	269.158	3.55	936.709	4.01	0.000	/	3,662.500	3.23	730.300	2.92	5,816.529	22
August	0.000	/	0.000	/	5.875	3.80	810.977	3.02	87.400	3.38	318.620	4.03	0.000	/	3,373.700	3.14	1,338.100	2.96	5,316.375	18
September	46.112	3.24	0.000	/	0.000	/	468.632	2.63	59.520	3.39	1,381.330	3.86	0.000	/	4,381.400	3.01	2,976.300	2.73	8,688.364	29
October	12.152	4.17	0.000	/	34.125	3.09	606.025	2.61	65.000	3.08	801.200	3.73	0.000	/	3,437.300	3.09	891.025	2.81	5,280.113	17
November	35.092	2.84	0.000	/	0.000	/	635.026	2.71	256.680	3.38	848.170	4.24	9.000	2.45	1,535.000	2.86	643.700	2.52	3,402.299	12
December	0.000	/	0.000	/	20.000	3.42	1,056.617	2.44	1,133.670	3.07	957.732	3.71	0.000	/	3,266.100	2.82	872.000	2.58	6,287.215	21
Total	538.321	3.00	7.000	3.41	129.000	2.85	7,327.195	2.63	7,335.790	3.38	10,228.983	4.00	9.000	2.45	37,926.550	3.13	9,858.925	2.92	65,177.595	229

Source: Tranalysis

Table 4.2.2-3 China's exports of atrazine by month, 2018

Month	38% SC		48% WP		50% SC		80% WP		90% WDG		97% Tech.		98% Tech.		Total volume (converted to 100% technical, tonne)	Value (million USD)
	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)	Volume (tonne)	Unit price (USD/kg)		
January	20.000	2.05	0.000	/	879.379	2.64	1,610.105	3.72	1,802.688	4.03	3,282.375	3.06	83.000	3.27	6,587.861	25
February	93.580	2.44	0.000	/	323.227	2.55	710.661	3.55	812.164	4.17	1,418.000	3.14	220.000	3.28	3,074.782	12
March	0.000	/	0.000	/	375.196	2.84	920.904	4.15	853.054	4.67	1,022.000	3.33	333.000	3.53	2,994.742	13
April	60.280	2.71	2.000	5.08	276.160	3.28	838.220	3.97	643.877	4.70	1,123.000	3.66	871.000	4.67	3,343.856	14
May	73.843	2.42	0.000	/	342.096	4.25	567.896	4.07	607.462	5.40	890.000	3.70	120.000	4.51	2,167.357	10
June	105.012	3.44	39.040	3.85	207.035	4.90	236.900	3.83	714.105	4.41	1,278.070	3.82	574.002	3.70	2,788.345	12
July	99.526	2.81	5.625	2.65	742.906	3.42	237.720	3.81	645.565	4.72	1,006.006	3.73	522.500	4.07	2,641.318	12
August	49.240	2.51	0.000	/	1,098.464	2.59	97.900	4.08	542.186	4.48	4,402.000	3.49	498.000	3.69	5,892.211	22
September	45.924	4.05	10.000	2.85	639.046	2.98	60.900	3.47	719.660	4.21	4,231.500	3.50	1,085.000	3.33	6,206.044	23
October	2.120	2.40	0.000	/	466.607	3.07	142.100	3.72	1,525.202	4.14	3,634.500	3.34	208.000	3.29	5,449.776	21
November	0.082	/	0.003	/	714.218	2.46	558.050	3.49	1,096.906	4.09	4,171.200	3.28	570.000	3.19	6,395.428	23
December	59.139	5.27	0.000	/	894.552	2.57	2,017.347	3.65	1,457.546	4.22	3,806.074	3.24	327.000	3.18	7,407.770	29
Total	608.665	3.09	56.665	3.60	6,958.886	2.93	7,998.703	3.78	11,420.415	4.34	30,264.725	3.38	5,411.502	3.70	54,949.486	214

Source: Tranalysis

By destination

Table 4.2.2-4 China's exports of atrazine by destination in 2020, tonne

No.	Destination	38% SC	48% WP	50% SC	80% WP	90% WDG	95% Tech.	97% Tech.	98% Tech.	Total volume (converted to 100% technical)	Value (million USD)
1	Brazil	0.000	0.000	0.000	0.000	1,873.925	3,440.000	11,223.400	2,578.000	18,367.671	52
2	Argentina	0.000	0.000	0.000	0.000	1,613.280	1,250.000	9,484.230	451.000	12,281.135	39
3	The US	0.000	0.000	0.000	0.000	514.240	9,455.050	2,435.211	0.000	11,807.268	31
4	India	0.000	0.000	0.000	0.000	0.000	1,533.000	1,015.000	1,148.000	3,565.940	8
5	Pakistan	84.600	0.000	148.260	21.000	330.700	2,133.600	111.100	893.148	3,424.480	10
6	Chile	0.000	0.000	421.878	0.000	142.400	1,580.000	447.000	0.000	2,272.203	7
7	Mexico	0.000	0.000	39.916	85.000	1,756.032	0.000	185.000	296.505	2,138.412	8
8	Ghana	0.000	0.000	414.180	2,331.198	0.000	0.000	0.000	0.000	2,066.139	8
9	Nigeria	0.000	0.000	94.422	2,131.340	7.000	0.000	0.000	0.000	1,757.443	6
10	Thailand	0.000	0.000	8.360	425.080	1,138.332	0.000	0.000	0.000	1,368.743	5
11	Australia	0.000	0.000	159.116	0.000	1,057.160	0.000	30.000	0.000	1,060.102	4
12	Indonesia	7.000	0.000	221.100	0.030	0.000	688.000	162.000	0.000	921.862	3
13	Paraguay	0.000	0.000	81.800	0.000	827.675	93.200	22.000	22.000	913.976	3
14	Vietnam	0.000	0.000	0.000	327.000	0.000	13.465	228.300	77.000	571.303	2
15	Peru	0.000	0.000	434.259	37.200	239.370	0.000	0.000	0.000	451.496	2
	Others	175.576	3.100	810.101	788.574	1,060.258	584.000	126.540	210.657	2,929.045	11
	Total	267.176	3.100	2,833.392	6,146.422	10,560.372	20,770.315	25,469.781	5,676.310	65,897.215	199

Source: Tranalysis

Table 4.2.2-5 China's exports of atrazine by destination in 2019, tonne

No.	Destination	38% SC	48% SC	48% WP	50% SC	80% WP	90% WDG	95% Tech.	97% Tech.	98% Tech.	Total volume (converted to 100% technical)	Value (million USD)
1	Brazil	0.000	0.000	0.000	1,251.800	0.000	1,833.701	0.000	13,231.550	6,260.000	21,194.913	67
2	The US	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10,793.600	700.000	11,155.792	33
3	Argentina	0.000	0.000	0.000	0.000	0.000	1,215.600	0.000	4,796.000	200.000	5,942.160	22
4	India	0.000	0.000	0.000	5.504	0.000	0.000	0.000	3,184.000	820.000	3,894.612	12
5	Nigeria	39.918	0.000	0.000	501.550	3,373.680	23.600	0.000	0.000	0.000	2,965.666	13
6	Chile	0.000	0.000	0.000	481.351	0.000	226.880	0.000	1,921.000	0.000	2,288.984	8
7	Thailand	0.000	0.000	0.000	172.968	536.120	1,284.812	0.000	120.000	0.000	1,781.888	7
8	Mexico	0.000	0.000	0.000	133.100	0.000	1,107.360	0.000	23.000	532.000	1,601.520	6
9	Ghana	0.000	0.000	0.000	401.098	1,429.760	0.000	0.000	0.000	0.000	1,320.833	6
10	Australia	0.000	0.000	0.000	60.600	0.000	1,290.780	0.000	15.000	10.000	1,213.928	5
11	Italy	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1,010.000	0.000	979.700	3
12	Indonesia	7.000	0.000	0.000	305.120	0.000	0.000	0.000	828.000	20.000	968.225	4
13	Venezuela	0.000	0.000	0.000	591.800	0.000	734.000	0.000	0.000	0.000	932.828	6
14	Pakistan	19.000	0.000	0.000	36.000	0.000	0.000	0.000	421.200	403.500	828.950	3
15	Paraguay	0.000	0.000	0.000	0.000	0.000	760.770	0.000	23.500	118.300	823.422	3
	Others	472.400	7.000	129.000	3,386.300	1,996.230	1,751.480	9.000	1,559.700	795.130	7,284.176	31
	Total	538.321	7.000	129.000	7,327.195	7,335.790	10,228.983	9.000	37,926.550	9,858.925	65,177.595	229

Source: Tranalysis

Table 4.2.2-6 China's exports of atrazine by destination in 2018, tonne

No.	Destination	38% SC	48% WP	50% SC	80% WP	90% WDG	97% Tech.	98% Tech.	Total volume (converted to 100% technical)	Value (million USD)
1	The US	0.000	0.000	0.000	0.000	0.000	14,732.500	0.000	14,290.525	45
2	Brazil	0.000	0.000	0.000	0.000	1,182.004	3,000.020	2,618.000	6,539.463	23
3	Argentina	0.000	0.000	0.000	0.000	2,191.200	4,010.900	20.000	5,882.253	24
4	Australia	0.000	0.000	149.440	0.000	3,818.490	0.000	30.000	3,540.051	16
5	Nigeria	0.000	35.040	479.291	3,136.149	37.400	0.000	0.000	2,787.792	13
6	India	0.000	0.000	0.000	0.000	0.000	2,215.600	560.000	2,697.932	9
7	Thailand	0.000	0.000	382.800	1,263.360	1,147.836	5.000	0.000	2,231.155	10
8	Israel	0.000	0.000	0.000	0.000	0.000	2,020.000	0.000	1,959.400	7
9	South Africa	0.000	19.625	767.350	0.000	131.160	734.006	579.502	1,780.516	8
10	Chile	0.000	0.000	1,049.560	0.000	186.560	909.050	0.000	1,553.094	7
11	Ghana	0.000	0.000	460.379	1,330.080	0.000	0.000	0.000	1,279.070	6
12	Mexico	0.000	0.000	125.120	0.000	997.316	51.000	260.000	1,259.409	6
13	Pakistan	16.000	0.000	36.000	0.000	0.000	609.500	369.000	975.475	3
14	Vietnam	0.000	0.000	23.100	859.627	0.000	213.000	34.000	938.610	5
15	Venezuela	0.000	0.000	0.000	0.000	0.000	0.000	700.000	686.000	2
	Others	592.665	2.000	3,485.846	1,409.487	1,728.449	1,764.149	241.000	6,548.742	32
	Total	608.665	56.665	6,958.886	7,998.703	11,420.415	30,264.725	5,411.502	54,949.486	214

Source: Tranalysis

By exporter

Table 4.2.2-7 China's exports of atrazine by exporter in 2020, tonne

No.	Exporter	38% SC	48% WP	50% SC	80% WP	90% WDG	95% Tech.	97% Tech.	98% Tech.	Total volume (converted to 100% technical)	Value million USD
1	Zhejiang Zhongshan Chemical Industry Group Co., Ltd.	0.000	0.000	258.560	999.100	473.940	3,327.000	11,123.250	0.000	15,294.966	44
2	Hebei Lingang Chemical Co., Ltd.	0.000	0.000	0.000	0.000	332.800	11,533.050	33.000	0.000	11,287.928	29
3	Shandong Weifang Rainbow Chemical Co., Ltd.	11.000	0.000	331.021	757.512	4,398.402	0.000	106.400	3,707.493	8,466.742	27
4	Shandong Binnong Technology Co., Ltd.	48.000	0.000	612.080	589.100	282.760	0.000	970.361	713.160	2,682.617	9
5	Shandong Dehao Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	2,300.000	0.000	2,231.000	7
6	CropScience Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	2,200.000	0.000	2,134.000	7
7	Hebei Huyang Import and Export Co., Ltd.	0.000	0.000	242.440	327.000	1,423.000	119.000	6.000	0.000	1,782.390	7
8	Shandong Runke International Trade Co., Ltd.	0.000	0.000	19.958	0.000	125.544	1,100.700	0.000	0.000	1,168.634	3
9	Zhejiang Changxing Zhongshan Import and Export Co., Ltd.	0.000	0.000	0.000	0.000	787.590	0.000	330.030	0.000	1,028.960	4
10	Shandong Kesai Agrochem Biotechnology Co., Ltd.	42.988	0.000	39.816	1,080.000	44.874	0.000	11.000	0.000	950.006	4
11	Zhejiang Province Changxing First Chemical Co., Ltd.	0.000	0.000	22.000	288.000	579.600	19.500	136.000	0.000	913.485	3
12	SANONE Co., Ltd.	0.000	0.000	19.400	0.000	44.000	440.000	440.000	1.000	894.304	3
13	Nanjing Bodao Logistics Co., Ltd.	0.000	0.000	0.000	0.000	0.000	775.000	0.000	0.000	736.250	2
14	Zhejiang Hengdian Imp. & Exp. Co., Ltd.	0.000	0.000	0.000	0.000	0.000	700.000	0.000	0.000	665.000	2
15	Nanjing Jiaqier Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	600.000	0.000	0.000	570.000	2
	Others	165.188	3.100	1,288.117	2,105.710	2,067.862	2,156.065	7,813.740	1,254.657	15,090.934	47
	Total	267.176	3.100	2,833.392	6,146.422	10,560.372	20,770.315	25,469.781	5,676.310	65,897.215	199

Source: Tranalysis

Table 4.2.2-8 China's exports of atrazine by exporter in 2019, tonne

No.	Exporter	38% SC	48% SC	48% WP	50% SC	80% WP	90% WDG	95% Tech.	97% Tech.	98% Tech.	Total volume (converted to 100% technical)	Value (million USD)
1	Zhejiang Zhongshan Chemical Industry Group Co., Ltd.	0.000	0.000	0.000	146.830	1,481.800	1,381.527	0.000	14,999.250	0.000	17,038.149	57
2	Shandong Weifang Rainbow Chemical Co., Ltd.	0.000	0.000	0.000	1,728.328	413.760	4,111.004	0.000	399.000	5,738.300	10,838.557	38
3	Hebei Lingang Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8,291.000	0.000	8,042.270	23
4	Hebei Shanli Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5,081.500	0.000	4,929.055	16
5	Shandong Binnong Technology Co., Ltd.	19.000	0.000	0.000	999.242	1,405.080	1,032.091	0.000	25.000	1,998.500	4,497.341	17
6	Hebei Huyang Import & Export Limited Corporation	0.000	0.000	0.000	129.200	340.000	552.760	0.000	2,520.000	0.000	3,276.132	11
7	Zhejiang Hengdian Imp. & Exp. Co., Ltd.	0.000	0.000	0.000	0.000	0.000	136.800	0.000	1,500.000	0.000	1,578.120	6
8	China Jiangsu International Economic Technical Cooperation Group Co., Ltd.	0.000	0.000	0.000	62.248	0.000	44.995	0.000	1,306.000	0.000	1,335.950	5
9	Shandong Kesai Agrochem Biotechnology Co., Ltd.	12.152	0.000	0.000	692.892	1,192.900	57.600	0.000	1.600	0.000	1,330.939	6
10	Ningxia Gerui Fine Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1,094.000	1,072.120	3
11	Beijing Kaixiang Hengye Trade Co., Ltd.	0.000	0.000	0.000	591.800	0.000	734.000	0.000	0.000	0.000	932.828	6
12	Zhejiang Province Changxing First Chemical Co., Ltd.	6.600	0.000	0.000	35.512	160.000	624.900	0.000	230.000	0.000	932.287	4
13	Shandong Qiaochang Modern Agriculture Import & Export Co., Ltd.	0.000	0.000	0.000	58.040	8.000	21.007	0.000	0.000	840.000	876.644	3
14	Shandong Runke International Trade Co., Ltd.	0.000	0.000	0.000	55.000	38.280	566.880	9.000	20.000	20.000	616.046	2
15	Nanjing Taikenuo International Trade Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	600.000	0.000	582.000	2
	Others	500.569	7.000	129.000	2,828.104	2,295.970	965.419	0.000	2,953.200	168.125	7,299.157	30
	Total	538.321	7.000	129.000	7,327.195	7,335.790	10,228.983	9.000	37,926.550	9,858.925	65,177.595	229

Source: Tranalysis

Table 4.2.2-9 China's exports of atrazine by exporter in 2018, tonne

No.	Exporter	38% SC	48% WP	50% SC	80% WP	90% WDG	97% Tech.	98% Tech.	Total volume (converted to 100% technical)	Value (million USD)
1	Hebei Shanli Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	16,977.881	0.000	16,468.545	52
2	Shandong Weifang Rainbow Chemical Co., Ltd.	0.000	0.000	1,042.592	698.986	3,988.562	10.000	3,568.502	8,152.320	35
3	Zhejiang Zhongshan Chemical Industry Group Co., Ltd.	0.000	35.040	214.791	1,690.590	2,472.351	4,205.020	0.000	7,775.808	31
4	Shandong Binnong Technology Co., Ltd.	16.000	0.000	1,397.556	1,011.935	1,656.872	326.000	1,047.000	4,331.584	19
5	Zhejiang Province Changxing First Chemical Co., Ltd.	0.000	0.000	0.000	80.000	1,046.849	586.000	0.000	1,574.585	7
6	JOC International Technical Engineering Co., Ltd.	0.000	0.000	0.000	0.000	0.000	1,540.000	0.000	1,493.800	6
7	Zhejiang Hengdian Imp. & Exp. Co., Ltd.	0.000	0.000	146.992	0.000	0.000	1,464.000	0.000	1,492.884	6
8	Anhui Zhongshan Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	1,200.000	0.000	1,164.000	4
9	Shandong Kesai Agrochem Biotechnology Co., Ltd.	0.000	0.000	390.314	1,119.000	15.000	0.000	0.000	1,095.401	5
10	High Hope Int'l Group Jiangsu Champion Holdings Ltd.	0.000	0.000	0.000	0.000	0.000	860.000	0.000	834.200	3
11	Hebei Huyang Import & Export Limited Corporation	0.000	0.000	0.000	452.250	448.800	0.000	0.000	765.720	4
12	China Jiangsu International Economic Technical Cooperation Group Co., Ltd.	0.000	0.000	21.956	17.300	0.000	754.000	0.000	756.154	3
13	Zhejiang Changxing Zhongshan Import and Export Co., Ltd.	0.000	0.000	0.000	14.000	670.400	0.000	0.000	614.560	3
14	Shandong Qiaochang Modern Agriculture Import & Export Co., Ltd.	0.000	0.000	36.000	7.000	0.000	0.000	560.000	570.960	2
15	Lianyungang Liben Crop Science and Technology Co., Ltd.	0.000	0.000	14.256	417.500	65.000	0.000	0.000	399.058	2
	Others	592.665	21.625	3,694.429	2,490.142	1,056.581	2,341.824	236.000	7,459.907	35
	Total	608.665	56.665	6,958.886	7,998.703	11,420.415	30,264.725	5,411.502	54,949.486	214

Source: Tranalysis

By manufacturer

Table 4.2.2-10 China's exports of atrazine by manufacturer in 2020, tonne

No.	Manufacturer	38% SC	48% WP	50% SC	80% WP	90% WDG	95% Tech.	97% Tech.	98% Tech.	Total volume (converted to 100% technical)	Value (million USD)
1	Zhejiang Zhongshan Chemical Industry Group Co., Ltd.	127.048	3.100	1,279.704	2,672.952	1,386.981	5,655.825	13,275.350	0.000	22,302.205	66
2	Hebei Lingang Chemical Co., Ltd.	0.000	0.000	281.800	331.000	1,775.800	12,387.050	39.000	0.000	13,809.448	38
3	Shandong Weifang Rainbow Chemical Co., Ltd.	11.000	0.000	372.983	765.512	5,256.516	1,100.700	451.430	3,707.493	10,645.890	34
4	Shandong Kesai Agrochem Biotechnology Co., Ltd.	47.488	0.000	55.926	1,088.000	79.669	0.000	4,637.940	0.000	5,485.453	18
5	Shandong Binnong Technology Co., Ltd.	74.640	0.000	718.443	680.600	302.760	700.000	982.161	1,767.817	4,543.575	14
6	Jiangsu Lulilai Co., Ltd.	0.000	0.000	0.000	72.130	0.000	831.740	187.000	0.000	1,029.247	3
7	Zhejiang Province Changxing First Chemical Co., Ltd.	0.000	0.000	72.600	288.000	658.620	19.500	142.000	0.000	1,015.283	3
8	Qiaochang Modern Agriculture Co., Ltd.	0.000	0.000	0.000	100.500	0.000	0.000	0.000	198.000	274.440	1
	Others	7.000	0.000	51.936	147.728	1,100.026	75.500	5,754.900	3.000	6,791.674	22
	Total	267.176	3.100	2,833.392	6,146.422	10,560.372	20,770.315	25,469.781	5,676.310	65,897.215	199

Source: Tranalysis

Table 4.2.2-11 China's exports of atrazine by manufacturer in 2019, tonne

No.	Manufacturer	38% SC	48% SC	48% WP	50% SC	80% WP	90% WDG	95% Tech.	97% Tech.	98% Tech.	Total volume (converted to 100% technical)	Value (million USD)
1	Zhejiang Zhongshan Chemical Industry Group Co., Ltd.	185.444	7.000	31.000	2,602.089	3,499.190	3,155.838	0.000	20,405.250	93.100	26,805.100	96
2	Hebei Shanli Chemical Co., Ltd.	4.515	0.000	0.000	788.040	491.580	1,290.760	0.000	16,316.500	0.000	17,748.938	58
3	Shandong Weifang Rainbow Chemical Co., Ltd.	0.000	0.000	0.000	1,606.219	366.340	3,396.424	0.000	394.000	5,637.300	9,995.448	35
4	Shandong Binnong Technology Co., Ltd.	23.800	0.000	0.000	1,158.380	1,661.500	1,969.218	0.000	741.000	3,888.525	8,169.759	30
5	Shandong Kesai Agrochem Biotechnology Co., Ltd.	2.200	0.000	0.000	380.392	831.900	243.800	0.000	0.000	0.000	1,062.934	5
6	Zhejiang Province Changxing First Chemical Co., Ltd.	234.430	0.000	0.000	182.512	2.000	0.000	0.000	0.000	0.000	181.532	1
	Others	87.932	0.000	98.000	609.563	483.280	172.943	9.000	69.800	240.000	1,213.882	5
	Total	538.321	7.000	129.000	7,327.195	7,335.790	10,228.983	9.000	37,926.550	9,858.925	65,177.595	229

Source: Tranalysis

Table 4.2.2-12 China's exports of atrazine by manufacturer in 2018, tonne

No.	Manufacturer	38% SC	48% WP	50% SC	80% WP	90% WDG	97% Tech.	98% Tech.	Total volume (converted to 100% technical)	Value (million USD)
1	Zhejiang Zhongshan Chemical Industry Group Co., Ltd.	329.860	45.040	3,375.191	2,948.272	4,678.251	10,457.894	75.000	18,563.138	76
2	Hebei Shanli Chemical Co., Ltd.	0.000	0.000	54.700	360.250	469.800	18,261.831	0.000	18,452.346	60
3	Shandong Weifang Rainbow Chemical Co., Ltd.	0.000	0.000	1,040.312	813.986	4,076.962	109.000	3,579.502	8,429.641	36
4	Shandong Binnong Technology Co., Ltd.	26.000	0.000	1,670.887	1,537.135	1,870.872	603.000	1,628.000	5,917.050	26
5	Shandong Kesai Agrochem Biotechnology Co., Ltd.	0.000	0.000	439.715	1,548.000	134.910	0.000	0.000	1,565.910	7
6	Shandong Vicome Greenland Chem Co., Ltd.	0.000	0.000	133.814	216.000	85.000	339.000	0.000	643.054	3
7	Shandong Qiaochang Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	405.000	129.000	519.270	2
	Others	252.805	11.625	244.267	575.060	104.620	89.000	0.000	859.077	4
	Total	608.665	56.665	6,958.886	7,998.703	11,420.415	30,264.725	5,411.502	54,949.486	214

Source: Tranalysis

5 Consumption of atrazine in China, 2018–2021

Atrazine is mainly applied to control annual weeds in corn and sugarcane fields, and it is also widely used in sorghum field, grape and tea garden, etc.

Domestically, atrazine formulations, mainly including 38% SC, 50% SC, 80% WP and 90% WDG, are applied. Notably, atrazine 38% SC plays the dominant role in domestic consumption. In 2021, atrazine 38% SC usage accounted for 65.76% of the total consumption volume.

In 2021, the actual domestic consumption volume of atrazine formulations was 16,751 tonnes (converted to 100% technical). According to National Bureau of Statistics of China, planting area of corn was 43.32 million ha in 2021, up by some 5% year on year, so there was a large increase in atrazine consumption on this crop.

It should be noticed that the long residual effect of this product has been a concern for years. There are risks that it would be replaced for safety and environmental protection by other herbicide products.

Table 5-1 Apparent consumption of atrazine (converted to 100% technical) in China in 2018–2021, tonne

Year	Output	Export	Import	Apparent consumption
2018	94,769	54,949	N/A	39,820
2019	65,863	65,178	N/A	685
2020	78,473	65,897	N/A	12,576
2021	75,854	62,196	N/A	13,658

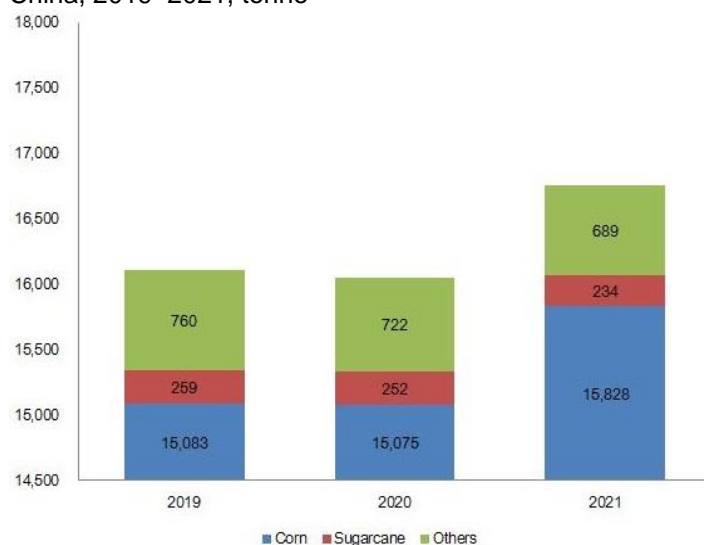
Note: Apparent consumption volume = Output - Export + Import
Source: CCM

Table 5-2 Actual consumption volume of major atrazine formulations in China in 2019–2021, tonne

Year	38% SC	50% SC	80% WP	90% WDG	Total
2019	23,660	7,500	1,660	2,855	35,675
2020	23,263	7,311	1,727	2,997	35,298
2021	24,195	7,625	1,832	3,140	36,792

Source: CCM

Figure 5-1 Actual consumption structure of atrazine formulations (converted to 100% technical) by crop in China, 2019–2021, tonne



Source: CCM

6 Competing products of atrazine in China

- Atrazine and its major substitutes in China

Table 6-1 Comparison among atrazine, 2,4-D and acetochlor in China, 2021

Item	Atrazine	2,4-Dichlorophenoxyacetic acid (2,4-D)	Acetochlor
Pesticide variety	Triazine herbicide	Phenoxyacetic herbicide	Chloroacetamide herbicide
Mode of action	Photosynthetic inhibitor	Growth regulator	Seedling growth inhibitor
Capacity of technical, t/a	140,000	250,700	87,000
Output of technical (converted to 100% AI), tonne	75,854	58,350	24,564
Operating rate	54%	23%	31%
Ex-works price, USD/t	97% TC: 3,910	96% TC: 3,622	92% TC: 4,972
Advantage	1. Good effect 2. High safety	1. High efficiency of weeding 2. Wide application areas 3. Low price	1. Broad spectrum 2. Convenient for application
Disadvantage	1. Long residual effect 2. Harmful to some rotated crops	High toxicity	1. Short pharmacodynamic period 2. Its metabolites on the surface water are hazardous to human health.

Source: CCM

- Other competing herbicides applied on corn

Table 6-2 Information of emerging competing herbicides applied on corn

Item	Topramezone	Amicarbazone	Tembotrione
Pesticide variety	Pyrazolone herbicide	Triazolone herbicide	Triketone herbicide
Mode of action	4-Hydroxyphenylpyruvate dioxygenase (HPPD) inhibitor	Photosynthetic inhibitor	HPPD inhibitor
First registration in China	Year 2013	Year 2016	Year 2021
Main specifications registered in China, as of 29 April 2022	97% TC, 30% SC, 4% OD, topramezone-atrazine 310g/L SC & 26% OD	97% TC, 70% WG, nicosulfuron-amicarbazone 26% OD & 24% OD	95% TC, 8% OD, tembotrione-atrazine 23.5% SC
Advantage	1. Compared with other HPPD-inhibiting herbicides, it has a highly effective control over broad spectrum annual warm season grasses. 2. Long lasting control 3. Strongly pronounced foliar activity even against advanced weed growth stages 4. Good crop safety	1. Broad spectrum 2. Have a good selectivity profile and is a more potent herbicide than atrazine, which enables its use at lower rate. 3. Low acute toxicity	1. Broad spectrum 2. It can easily dissolve in water with safety to aquatic environment. 3. It is unlikely to enter the atmosphere and travel long distances in air.
Disadvantage	1. Insufficient control against cool season grasses 2. High price due to limited capacity and expensive raw materials	1. Inefficient if applied before rainfall 2. Poor performance upon the soil with a pH rating above 7.4	Its breakdown products have a potential to move down through the soil.

Source: CCM

7 Conclusions & trend

In 2020–2021, China's atrazine industry walked out of overstock and the production bounced back. Reasons for the recovery include:

- Limited supply from foreign counterparts;
- Rapid growth of corn-growing areas in China in 2021;
- New opportunities courtesy of atrazine's excellent mixing ability with other pesticides.

Atrazine is still the first herbicide choice for corn, sugarcane, fruits and vegetables etc., despite launches of new pesticides. Besides, atrazine-containing mixed formulation pool has been proactively expanding. For instance, the mixture of atrazine with tembotrione (tembotrione-atrazine 23.50% SC) was registered in China in 2021 for the first time.

Currently, domestic capacity of atrazine 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 large improvement in the coming years. Moreover, as the Chinese government determines to curb blind expansion of high-energy consumption and high-emission projects and promotes green transformation in key industries and enterprises, an updated 2021 edition of the *Comprehensive Catalogue for Environmental Protection* was released by the Ministry of Ecology and Environment of the People's Republic of China on 25 Oct., 2021, on which atrazine was labeled with "high pollution and high environmental risks". It is expected that the atrazine market in China will be in a gradual decline in future.

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

Website: <http://www.cnchemicals.com>

Tel: +86-20-37616606

Fax: +86-20-37616968

Email: econtact@cnchemicals.com