

2,4-D Survey in China 2021

The Eighth Edition

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Kcomber Inc.

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Executive summary

2,4-D products, with a history of production and application exceeding 30 years in China, enjoy a stable market demand. Farmers prefer to use 2,4-D as a herbicide in wheat-, corn- and rice-growing fields or as a plant growth regulator applied on eggplant, tomato, pumpkin, watermelon and etc. But production of 2,4-D butylate products has been banned in domestic market since late Jan. 2021.

In 2021, China 2,4-D capacity remained at 250,700 t/a and the output (converted to technical 100%) was some 58,350 tonnes. The ex-works price of 2,4-D technical saw significant uptrend this year due to increased cost of key raw materials.

Most 2,4-D products, including 96% 2,4-D technical, 98% 2,4-D technical, 2,4-D amine salt 720g/L SL and 2,4-D amine salt 860g/L SL, are for export. 2,4-D butylate EC is mainly consumed in the domestic market, yet 2,4-D butylate products are to be withdrawn from Chinese market after Jan. 2023. It is believed that 2,4-D still enjoys a promising prospect in China. Demand for 2,4-D will keep stable from home and abroad and demand for 2,4-D butylate would be replaced by other products, such as 2,4-D-ethylhexyl.

Scope and methodology

This report aims to demonstrate the development of 2,4-D industry in China and analyse the factors behind it. There are almost complete records and comments about technology, production, price, exports and consumption of this product in the report.

Region: China

Time scope: 2016–2021

● Methodology

The report is drafted by diverse methods as follows:

1. Desk research

The sources of desk research are various, including published magazines, journals, government statistics, industrial statistics, customs statistics, association seminars as well as information from the Internet. A lot of work has gone into the compilation and analysis of the obtained information. When necessary, checks have been made with Chinese suppliers regarding market information such as key producers, key end users, production and demand.

2. Telephone interview

CCM has carried out extensive telephone interviews in order to survey the actual market situation of 2,4-D industry in China.

Interviewees cover:

- Key producers
- Key traders
- Associations
- Experts

3. Network research

CCM adopted network to contact with players in the industry through B2B websites and software. CCM also obtained registration information via network.

● Data processing and presentation

The data collected and compiled are sourced from:

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

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

● Unit

USD: currency unit in the US

RMB: currency unit in China, also called Yuan

Tonne: ton, equal to metric ton in this report

t/a: tonne/annual or tonne/year

/t: per tonne

Table null-1 Abbreviations and full names

Abbreviation	Full name
AS	Aqueous solution
TC	Technical material
TK	Technical concentrate
EC	Emulsifiable concentrate
ICAMA	Institute for the Control of Agrochemicals, Ministry of Agriculture and Rural Affairs

Source: CCM

Table null-2 USD/CNY exchange rate, Jan. 2013–Dec. 2021

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
2013	6.2787	6.2842	6.2743	6.2471	6.1970	6.1718	6.1725	6.1708	6.1588	6.1393	6.1372	6.1160	6.1920
2014	6.1043	6.1128	6.1358	6.1553	6.1636	6.1557	6.1569	6.1606	6.1528	6.1441	6.1432	6.1238	6.1428
2015	6.1272	6.1339	6.1507	6.1302	6.1143	6.1161	6.1167	6.3056	6.3691	6.3486	6.3666	6.4476	6.2288
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 Brief introduction to 2,4-D in China

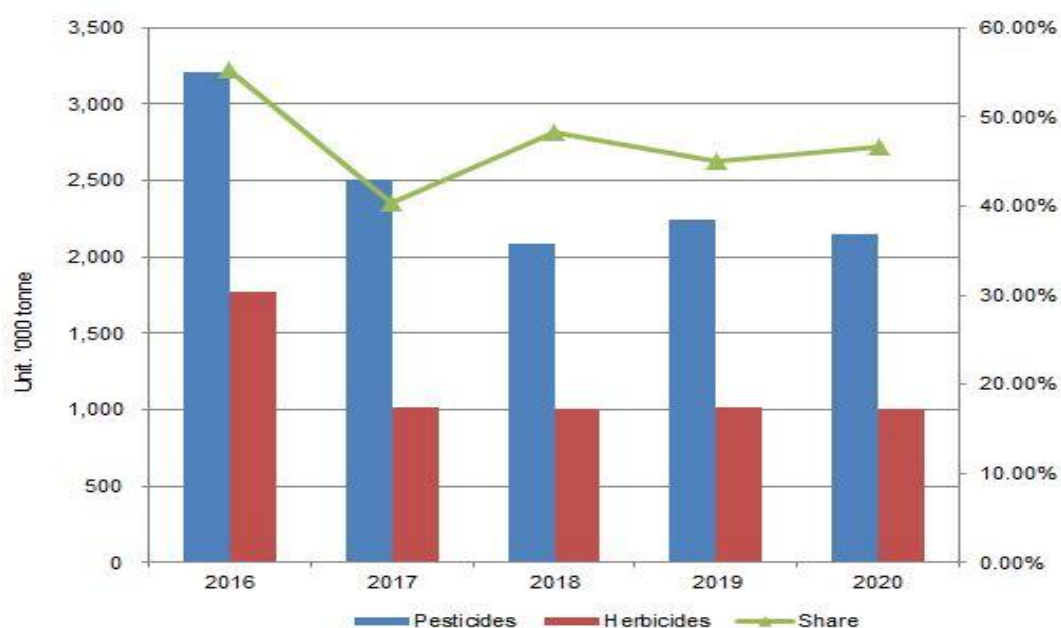
- Brief introduction to herbicide industry

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 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

Table 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

- Position of 2,4-D in herbicide industry

2,4-Dichlorophenoxyacetic acid (commonly referred to as 2,4-D) is one of the most widely used herbicides throughout the world. It effectively controls unwanted and invasive weeds across agricultural fields, lawns, public parks, lakes and more. Introduced in 1946, 2,4-D is among the most rigorously researched of all time.

Very few herbicides have been subjected to the extensive examinations and reviews that 2,4-D has withstood, and as a result, more is known about 2,4-D than almost any other herbicides on the planet. With more than 70 years' history, 2,4-D continues to be one of the most important herbicides for homeowners, land managers and farmers across the globe.

China began to introduce the technology and produce 2,4-D from the 1980s. After more than 30 years' development, China has become one of the major 2,4-D suppliers in the world. As of Jan. 2022, the country's capacity of 2,4-D technical was 250,700 t/a. Yet in the past two years, the overall operating rate was at a low level. In order to survive and prosper in mounting environmental protection pressures, domestic manufacturers, especially large ones, have been seeking technological improvements to enhance their competitiveness.

Since 2018, 2,4-D products have performed stably and still been the mainstream herbicide products in China. The prohibitive use of paraquat AS and resistance against glyphosate might help stimulate the application of 2,4-D products. Plus, a large number of overseas pesticide manufacturers had stopped production of 2,4-D in their own countries and purchased the product from China. Besides, domestic producers expanded capacity in 2019, which greatly increased the share of China's 2,4-D in the global market.

2,4-D has the advantages of low toxicity, friendliness to the environment and mature technology. According to investigations, Chinese 2,4-D technical is mainly exported to overseas market. In the domestic market, enterprises sell its formulations mainly, such as 2,4-D amine salt SL. Most of the 2,4-D formulations are used in China's northern part for killing broadleaf weeds, while farmers in China's southern part usually use the 2,4-D amine salt to kill water hyacinth.

Table 1-2 Domestic output and consumption of 2,4-D technical and related shares in herbicides, 2013–2020

Year	Output, tonne		Output share	Consumption, tonne		Consumption share
	Herbicides (100% technical)	Output share		Herbicides (100% technical)	2,4-D (100% technical)	
2013	1,799,823	69,504	3.86%	114,200	12,646	11.07%
2014	1,803,049	60,720	3.37%	109,000	13,592	12.47%
2015	1,771,918	68,352	3.86%	109,400	10,795	9.87%
2016	1,772,982	85,632	4.83%	104,700	14,148	13.51%
2017	1,016,000	92,448	9.10%	96,500	8,777	9.10%
2018	1,006,200	61,699	6.13%	95,500	10,957	11.47%
2019	1,011,000	69,830	6.91%	95,000	11,230	11.82%
2020	1,004,000	64,144	6.39%	90,535	10,679	11.80%

Source: CCM

2 Production of 2,4-D in China

2.1 Technology

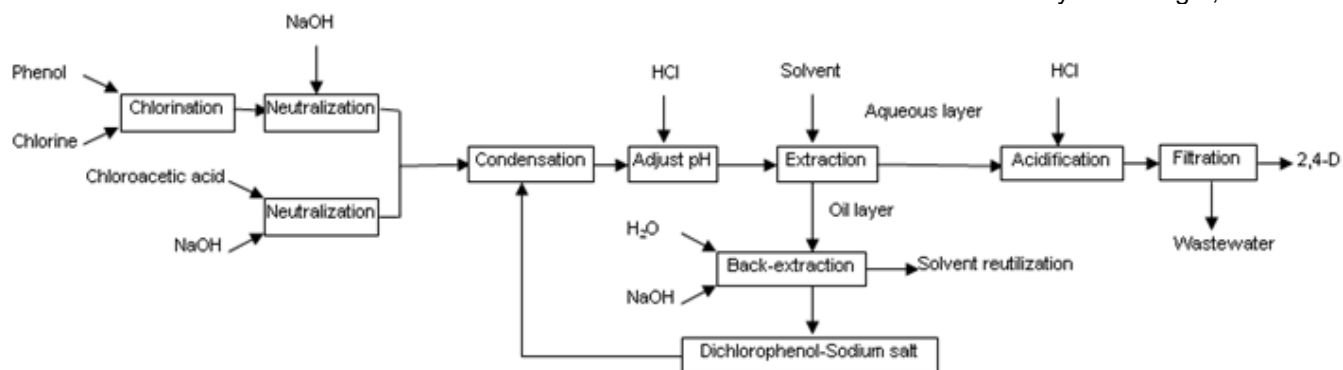
Currently, there are mainly two methods for synthesizing 2,4-D technical. The first method is chloridizing phenol by chlorine and then through condensation with chloroacetic acid; the second method is condensation and then followed by chlorination process.

At present, the first method is still widely adopted by most 2,4-D producers in China, which is probably going to change as the government becomes stricter on environmental protection. The process in the second method is more reasonable in theory and generates less pollutant, although there are still some technology problems that need to be solved during this process. In 2016, Jiangxi Tianyu Chemical Co., Ltd. put its new production line (capacity: 20,000 t/a) into operation in use of the second method.

The problems in the first method include: difficulty in controlling the completion time of phenol-chlorination, the intermediate compound (2,4-dichlorophenol)'s high content of phenol and byproducts, such as chlorophenol and trichlorophenol, as well as low product content.

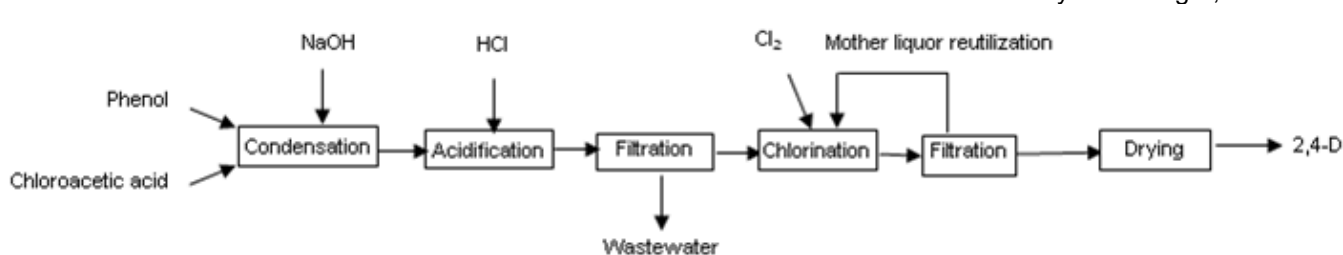
Major domestic 2,4-D technical producers like Changzhou Wintafone Chemical Co., Ltd. and Shandong Weifang Rainbow Chemical Co., Ltd. have been engaged in the research of 2,4-D synthesis technology for many years and have made great progress in improving the purity of 2,4-dichlorophenol and optimizing the production process of 2,4-D, etc., which makes the production process more environment-friendly and cost-effective.

Picture 2.1-1 The flowchart of the method of chlorination followed with condensation for synthesizing 2,4-D



Source: Ministry of Environmental Protection of the People's Republic of China & CCM

Picture 2.1-2 The flowchart of the method of condensation followed with chlorination for synthesizing 2,4-D



Source: Ministry of Environmental Protection of the People's Republic of China & CCM

Picture 2.1-3 Unit consumption volume of main raw materials in two methods for synthesizing 2,4-D

No.	Raw material	Specification	Chlorination first and then condensation	Condensation first and then chlorination
			Unit consumption, t/t	Unit consumption, t/t
1	Phenol	99.0%	0.490	0.450
2	Chloroacetic acid	98.0%	0.632	0.625
3	Liquid chlorine	99.9%	0.735	0.750
4	Liquid caustic soda	32.0%	1.982	2.180

Source: China Crop Protection Industry Association

Picture 2.1-4 Consumption of energy in two methods for synthesizing 2,4-D

No.	Item	Specification	Chlorination first and then condensation	Condensation first and then chlorination
			Consumption quota	Consumption quota
1	Water, t	0.4Mpa	10	10
2	Electricity, kWh	380V/220V	350	350
3	Steam, t	0.8/1.5Mpa	2	2

Source: China Crop Protection Industry Association

2.2 Key raw materials

Raw materials in the production of 2,4-D are outsourced by most domestic producers, mainly including chloroacetic acid and phenol. Increased cost of these two raw materials in 2021 brought about significant jumps in the price of 2,4-D technical.

- Chloroacetic acid

Supported by high price of raw materials like liquid chlorine and glacial acetic acid, the average market price of chloroacetic acid in 2021 experienced 110% increase over the average in 2020. In Shandong Province, where many 2,4-D producers are located, average price of chloroacetic acid there was USD1,320/t in 2021, double the price of USD629/t in 2020. The market price of chloroacetic acid in Shandong Province mainly fluctuated above USD1,000/t in 2021, and even peaked at USD1,796/t in Oct. 2021 because of lower operating rate.

In general, operating rate of chloroacetic acid industry stood at 69.71% in China in 2021; the domestic output was expected to reach 767,600 tonnes, up by 16.14% from the 660,900 tonnes in 2020, thanks to new capacity thrown into operation. In H1 2021, Dongying Huatai Chemical Group Co., Ltd. put its production lines into use. Jiangsu Dongpu New Material Technology Co., Ltd. completed the construction of 50,000 t/a chloroacetic acid project and put it into trial production before Nov. 2021.

- Phenol

Phenol is a very important chemical raw material, mainly used in the production of phenolic resin, bisphenol A and caprolactam. It is also applied to produce pesticides, medicines and other products. Only about 5% of China's phenol consumption is used to produce 2,4-D each year.

Import volume of phenol went up year by year in 2018–2020, due to downstream demand growth and shrunk domestic supply caused by environmental protection inspections. In 2020, China's import volume of this product reached a record high at 709,900 tonne, up 51.82% year on year. But, in 2021, the total import volume slipped 26.43% year on year to 522,300 tonnes, while the export volume from China was about 135,100 tonnes, posting a year-on-year increase of 744.38%. The reason for decreased import and increased export was the realization of new capacity like 350,000 t/a from Lihuayi Weiyuan Chemical Co., Ltd. and 650,000 t/a from Zhejiang Petroleum & Chemical Co., Ltd.

Regarding ex-works price of phenol, it ran all the way high in 2021; the December price was recorded at USD1,578/t, up 71.79% from USD918/t in Jan.

Generally speaking, the market price of 2,4-D was pushed up in 2021, mainly because of the higher cost of key raw materials. Although the international market will return to a more normal state in the near future, it is expected that ex-works prices of chloroacetic acid and phenol will fluctuate at a high level in early 2022. Yet in a longer term, with new capacity of these two raw materials reaching its full potential, raw material cost will be brought down for 2,4-D producers and thus their pressures relieved to some extent.

2.3 Registration

As of Dec. 2021, the number of registered 2,4-D products reached 323.

On 7 Sept., 2016, the then Ministry of Agriculture of the People's Republic of China issued the No. 2445 Announcement, which illustrates that from the time this announcement was issued, field test, registration application, and registration renewal application of 2,4-D butylate (including TC, TK, single formulations and mixed formulations) are no longer accepted and approved. This marks that production of 2,4-D butylate will be banned in domestic market after their domestic registrations expire. As long as the registration certificate 50% acetochlor · atrazine · 2,4-D butylate SE (registration code PD20160077) expired on 28 Jan., 2021, supply of 2,4-D butylate products completely stopped in China ever since; operation and use of such products are also expected to be stopped in domestic market since 29 Jan., 2023, as product validity period lasts two years. It also means that all the 2,4-D butylate products, which are sold in the domestic market and labeled as manufactured after the banned date, should be identified as fake or illegal pesticides.

But 2,4-D butylate TC producers can still register the product for overseas use, and they can change the registration to export-oriented registration when they apply for registration renewal. Overseas market plays a very important role in consuming the 2,4-D products made in China.

Table 2.3-1 Valid registrations of 2,4-D in China, as of Dec. 2021

Specification		Number of registrations
Single formulations	EC	32
	AS	30
	Others	20
Mixed formulations		191
Technical	2,4-D	26
	2,4-D-ethylhexyl	13
	2,4-D butylate	6
	2,4-D Na	4
	2,4-DB	1
Total		323

Source: Institute for the Control of Agrochemicals, Ministry of Agriculture (ICAMA)

Table 2.3-2 Valid registration of 2,4-D technical in China, as of Jan. 2022

No.	Registration code	Registrant (CN)	Registrant	Active ingredient	Content	Expiry date
1	PD20190029	辽宁先达农业科学有限公司	Liaoning Cynda Agricultural Science Co., Ltd.	2,4-DB	95%	2024/1/29
2	PD20181196	山东科源化工有限公司	Shandong Keyuan Chemical Co., Ltd.	2,4-D-ethylhexyl	97%	2023/3/15
3	PD20171970	江苏凯晨化工有限公司	Jiangsu Kaichen Chemical Co., Ltd.	2,4-D	98%	2022/9/18
4	PD20171765	山东滨农科技有限公司	Shandong Binnong Technology Co., Ltd.	2,4-D	98%	2022/9/18
5	PD20171643	江苏凯晨化工有限公司	Jiangsu Kaichen Chemical Co., Ltd.	2,4-D-ethylhexyl	96%	2022/8/21
6	PD20171094	宁夏格瑞精细化工有限公司	Ningxia Gerui Fine Chemical Co., Ltd.	2,4-D	98%	2022/5/31
7	PD20170719	安徽兴隆化工有限公司	Anhui Xinglong Chemical Co., Ltd.	2,4-D	98%	2022/4/10
8	PD20170643	威海韩孚生化药业有限公司	Weihai Hanfu Biochemical Medicine Co., Ltd.	2,4-D	98%	2027/4/9
9	PD20170553	江西天宇化工有限公司	Jiangxi Tianyu Chemical Co., Ltd.	2,4-D Na	96%	2027/4/9
10	PD20170425	安道麦股份有限公司	ADAMA Ltd.	2,4-D	98%	2027/3/8
11	PD20161171	四川省乐山市福华通达农药科技有限公司	Fuhua Tongda Agro-chemical Technology Co., Ltd.	2,4-D	98%	2026/9/13
12	PD20161082	江苏诺恩作物科学股份有限公司	Jiangsu Noon Crop Science Co., Ltd.	2,4-D	98%	2026/8/30
13	PD20161061	江西天宇化工有限公司	Jiangxi Tianyu Chemical Co., Ltd.	2,4-D-ethylhexyl	97%	2026/8/30
14	PD20161007	宁夏新安科技有限公司	Ningxia Wynca Technology Co., Ltd.	2,4-D	96%	2026/8/30
15	PD20160947	江苏常丰农化有限公司	Jiangsu CF Agrochemical Co., Ltd.	2,4-D	96%	2026/7/27
16	PD20160636	江西天宇化工有限公司	Jiangxi Tianyu Chemical Co., Ltd.	2,4-D	98%	2026/4/27
17	PD20160262	南通泰禾化工股份有限公司	CAC Nantong Chemical Co., Ltd.	2,4-D	98%	2026/2/25
18	PD20160258	内蒙古莱科作物保护有限公司	Inner Mongolia Laike Crop Protection Co., Ltd.	2,4-D	96%	2026/2/25
19	PD20160117	内蒙古中高化工有限公司	Inner Mongolia Zhonggao Chemical Co., Ltd.	2,4-D	98%	2026/1/28
20	PD20160025	浙江宇龙生物科技股份有限公司	Zhejiang Udragon Bioscience Co., Ltd.	2,4-D	96%	2026/1/26
21	PD20152544	山东科源化工有限公司	Shandong Keyuan Chemical Co., Ltd.	2,4-D	98%	2025/12/5
22	PD20152034	山东潍坊润丰化工股份有限公司	Shandong Weifang Rainbow Chemical Co., Ltd.	2,4-D-ethylhexyl	96%	2025/9/6
23	PD20150743	江苏莱科化学有限公司	Lion Agrevo (Jiangsu) Co., Ltd.	2,4-D-ethylhexyl	96%	2025/4/20
24	PD20141790	大连松辽化工有限公司	Dalian Songliao Chemical Industry Co., Ltd.	2,4-D-ethylhexyl	96%	2024/7/14

No.	Registration code	Registrant (CN)	Registrant	Active ingredient	Content	Expiry date
25	PD20141252	嫩江绿芳化工有限公司	Nenjiang Green Fang Chemical Co., Ltd.	2,4-D-ethylhexyl	96%	2024/5/7
26	PD20132601	安道麦辉丰（江苏）有限公司	ADAMA Huifeng (Jiangsu) Co., Ltd.	2,4-D butylate	96%	2023/12/17
27	PD20132175	安徽兴隆化工有限公司	Anhui Xinglong Chemical Co., Ltd.	2,4-D-ethylhexyl	96%	2023/10/29
28	PD20131455	江苏省农用激素工程技术研究中心有限公司	Jiangsu Agrochem Laboratory Co., Ltd.	2,4-D-ethylhexyl	96%	2023/7/5
29	PD20121778	安道麦辉丰（江苏）有限公司	ADAMA Huifeng (Jiangsu) Co., Ltd.	2,4-D-ethylhexyl	96%	2022/11/16
30	PD20121610	江苏常丰农化有限公司	Jiangsu CF Agrochemical Co., Ltd.	2,4-D-ethylhexyl	96%	2022/10/29
31	PD20110525	江苏永泰丰作物科学有限公司	Jiangsu Wintafone Crop Science Co., Ltd.	2,4-D Na	95%	2026/5/12
32	PD20101883	重庆依尔双丰科技有限公司	Chongqing Yi'er Shuangfeng Technology Co., Ltd.	2,4-D	96%	2025/8/9
33	PD20101752	安徽华星化工有限公司	Anhui Huaxing Chemical Industry Co., Ltd.	2,4-D	97%	2025/7/7
34	PD20101693	四川润尔科技有限公司	Sichuan Run'er Technology Co., Ltd.	2,4-D Na	96%	2025/6/17
35	PD20101186	安道麦辉丰（江苏）有限公司	ADAMA Huifeng (Jiangsu) Co., Ltd.	2,4-D	98%	2025/1/28
36	PD20100515	江苏好收成韦恩农化股份有限公司	Jiangsu Good Harvest-Weien Agrochemical Co., Ltd.	2,4-D	96%	2025/1/14
37	PD20100492	山东潍坊润丰化工股份有限公司	Shandong Weifang Rainbow Chemical Co., Ltd.	2,4-D butylate	96%	2025/1/14
38	PD20100053	江苏永泰丰作物科学有限公司	Jiangsu Wintafone Crop Science Co., Ltd.	2,4-D-ethylhexyl	96%	2025/1/4
39	PD20098432	佳木斯黑龙农药有限公司	Jiamusi Heilong Pesticide Co., Ltd.	2,4-D	96%	2024/12/24
40	PD20097077	山东潍坊润丰化工股份有限公司	Shandong Weifang Rainbow Chemical Co., Ltd.	2,4-D Na	80.50%	2024/10/10
41	PD20096452	江苏永泰丰作物科学有限公司	Jiangsu Wintafone Crop Science Co., Ltd.	2,4-D butylate	96%	2024/8/5
42	PD20096062	大连松辽化工有限公司	Dalian Songliao Chemical Industry Co., Ltd.	2,4-D butylate	96%	2024/6/18
43	PD20095816	江苏永泰丰作物科学有限公司	Jiangsu Wintafone Crop Science Co., Ltd.	2,4-D	96%	2024/5/27
44	PD20095714	佳木斯黑龙农药有限公司	Jiamusi Heilong Pesticide Co., Ltd.	2,4-D butylate	92%	2024/5/18
45	PD20095450	大连松辽化工有限公司	Dalian Songliao Chemical Industry Co., Ltd.	2,4-D	96%	2024/5/11
46	PD20094995	河北万全力华化工有限责任公司	Hebei Wanquan Lihua Chemicals Co., Ltd.	2,4-D butylate	96%	2024/4/21

No.	Registration code	Registrant (CN)	Registrant	Active ingredient	Content	Expiry date
47	PD20094572	河北万全华化工有限责任公司	Hebei Wanquan Lihua Chemicals Co., Ltd.	2,4-D	96%	2024/4/9
48	PD20093897	首建科技有限公司	Shoujian Technology Co., Ltd.	2,4-D	96%	2024/3/26
49	PD20093457	山东潍坊润丰化工股份有限公司	Shandong Weifang Rainbow Chemical Co., Ltd.	2,4-D	98%	2024/3/23
50	PD20060011	科迪华农业科技有限责任公司	Corteva, Inc.	2,4-D-ethylhexyl	94.40%	2026/1/9

Source: ICAMA

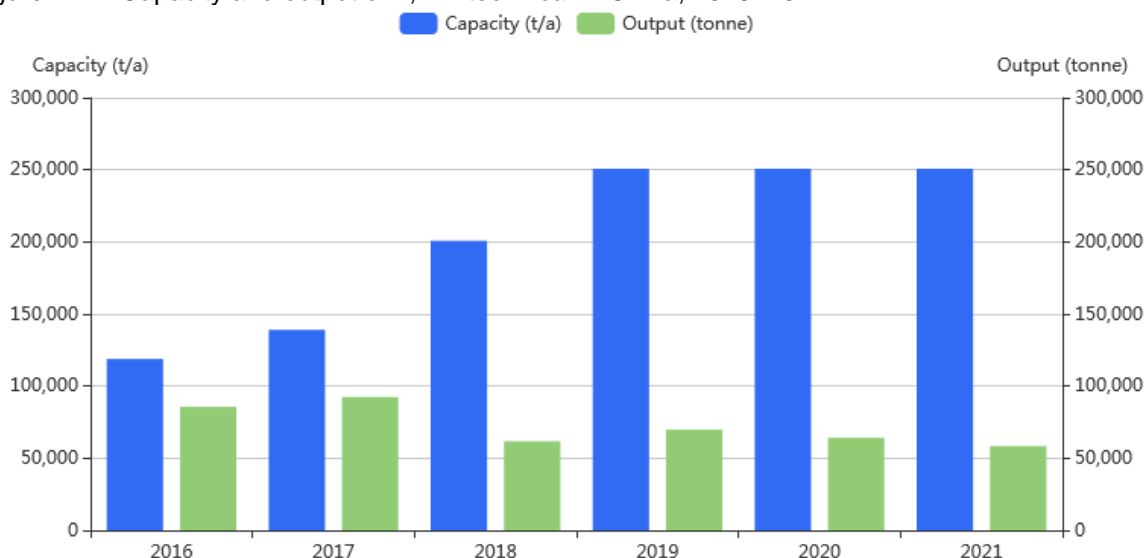
2.4 Capacity and output, 2016–2021

The capacity of 2,4-D grew rapidly from 200,700 t/a in 2018 to 250,700 t/a in 2019, up by 24.91%. It kept unchanged in 2020 and 2021.

As to the output, since 2018, facing environmental protection pressures, many domestic 2,4-D producers have suspended or even stopped production. In 2018, the output dropped to 61,699 tonnes (calculated on 100% technical, the same hereinafter), a sharp drop of 33.26% from that in 2017. As domestic production recovered, the output increased to 69,830 tonnes in 2019. By the end of 2020, China achieved its target of reducing pesticide use and increasing efficiency of pesticides successfully, and the output in 2020 dropped to 64,144 tonnes. Due to the Dual Control policy on energy consumption & energy intensity rolled out in H2 2021, 2,4-D manufacturers lowered operating rates, and the annual output slipped to 58,350 tonnes.

Over the years, fierce competition caused by oversupply and enormous environmental protection pressures have greatly challenged domestic players. China's 2,4-D industry has witnessed fast growth in capacity, especially so since the acceleration of industry integration. Yet an obvious decline in the output took place in 2018, mainly due to stricter implementation of environmental protection laws and sluggish demand from overseas market. After the temporary supply shortage in 2018, domestic 2,4-D production increased greatly along with recovering demand since 2019.

Figure 2.4-1 Capacity and output of 2,4-D technical in China, 2016–2021

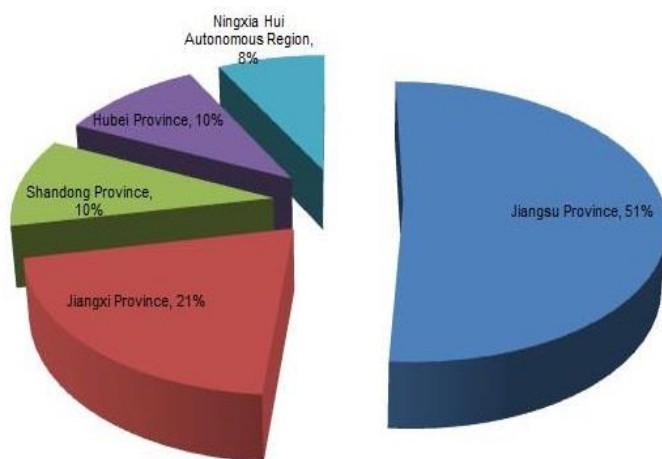


Note: All the volumes of output are calculated by 100% technical.
Source: CCM

2.5 Key producers

At present, most 2,4-D technical producers in China are still located in Jiangsu Province even though it has been under great pressures of environmental protection in recent years. Jiangsu has always been a crucial domestic pesticide production base and has advantages on abundant raw material supply, convenient transportation and large consumption.

Picture 2.5-1 Capacity distribution of top six 2,4-D technical manufacturers in China by region, 2021



Source: CCM

In general, there were more than 10 active 2,4-D producers in China in 2021, who have faced not only intensive competition, but also heavy pressures from the government's green development pursuit these years. Equipment of ADAMA Ltd. (ADAMA, 000553) lied idle for a long period, but the company announced in Nov. 2021 that production in its Jinzhou base would recover over the coming months.

Table 2.5-1 Production of major 2,4-D technical producers in China, 2016–2021

No.	Producer	Location	Status, as of Dec. 2021	Capacity, t/a						Output, tonne					
				2021	2020	2019	2018	2017	2016	2021	2020	2019	2018	2017	2016
1	CAC Nantong Chemical Co., Ltd.	Jiangsu Province	Active	50,000	50,000	50,000	20,000	5,000	5,000	12,000	18,000	3,000	1,500	3,000	4,000
2	Changzhou Wintafone Chemical Co., Ltd.	Jiangsu Province	Active	50,000	50,000	50,000	50,000	50,000	20,000	800	1,500	2,600	4,000	38,000	18,000
3	Jiangxi Tianyu Chemical Co., Ltd.	Jiangxi Province	Active	40,000	40,000	40,000	20,000	20,000	20,000	16,000	25,000	28,000	20,000	16,000	14,000
4	Shandong Weifang Rainbow Chemical Co., Ltd.	Shandong Province	Active	20,000	20,000	20,000	20,000	10,000	15,000	11,460	6,000	11,000	9,000	8,000	13,000
5	ADAMA Ltd. (Hubei Sanonda Co., Ltd.)	Hubei Province	Active	20,000	20,000	20,000	20,000	10,000	10,000	20	0	20	20	0	6,000
6	Ningxia Gerui Fine Chemical Co., Ltd.	Ningxia Hui Autonomous Region	Active	15,000	15,000	15,000	15,000	0	0	6,680	6,000	8,000	3,500	/	/

Source: CCM

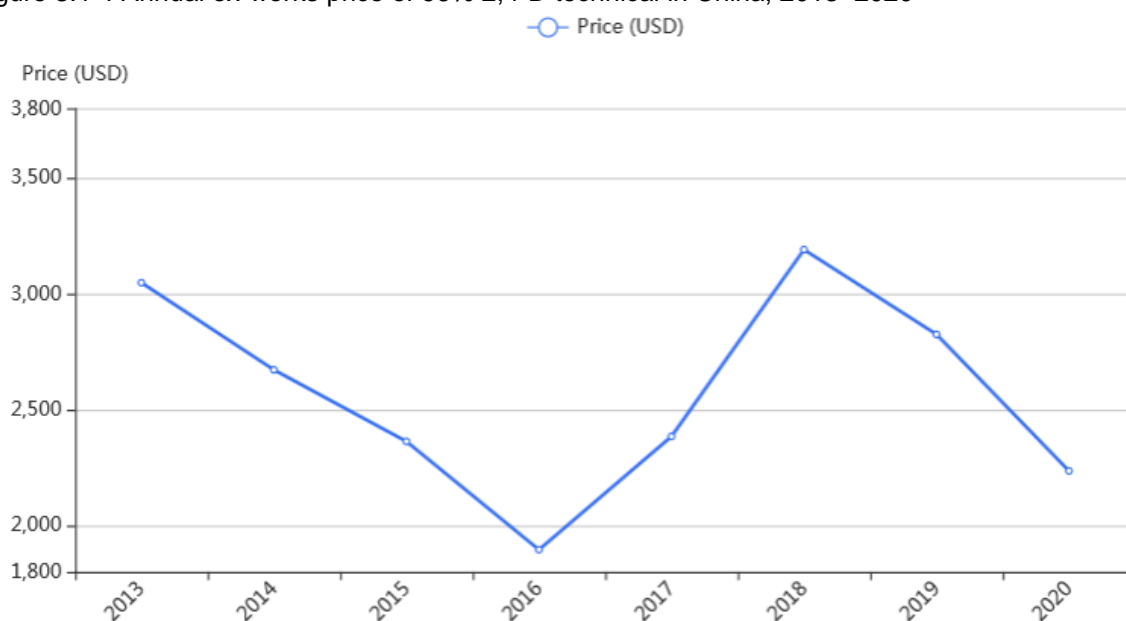
3 Price & exports of 2,4-D in China

3.1 Price

From 2013 to 2016, the annual ex-works price of 2,4-D was on decline in China. Then the annual price rebounded, reaching USD3,190.71/t in 2018. High environmental protection pressures had led to tight supply of 2,4-D, which was the main reason for the price increase. From Jan. 2019 to March 2020, with production resumption and back-to-normal operation of its manufacturers, the price significantly dropped in China. In 2020, the overall price of 2,4-D technical in China was relatively stable, the annual average recorded at USD2,235.94/t.

In 2021, the ex-works price of 2,4-D technical rose continuously, hitting USD5,024.10/t in Dec. 2021, up by 125% compared with the 2020 annual average. Domestic production of 2,4-D technical was affected by policies, such as the Dual Control on energy consumption and Power Rationing (as of 31 Dec., 2021), resulting supply shortage and intermittent suspension of pesticide production in some regions of Zhejiang, Jiangsu and etc. Rising price of raw materials also contributed greatly to the price rise. Considering a downward trend in the price of raw materials since Oct. 2021, it was believed that the price of 2,4-D would not go up further in the short term. However, escalating geopolitical tensions between Russia and Ukraine led a price hike of basic raw materials, which would prop up 2,4-D price.

Figure 3.1-1 Annual ex-works price of 96% 2,4-D technical in China, 2013–2020



Source: CCM

Figure 3.1-2 Monthly ex-works price of 96% 2,4-D technical in China, Jan. 2020–Dec. 2021



Source: CCM

3.2 Exports

Thanks to easing global COVID-19 pandemic, China's domestic economy has continued to recover. Chinese pesticide suppliers answer to about 70% of global demand. And the pandemic has directed more overseas orders to China. In 2021, China maintained stability in its domestic economy and the pesticide production grew steadily.

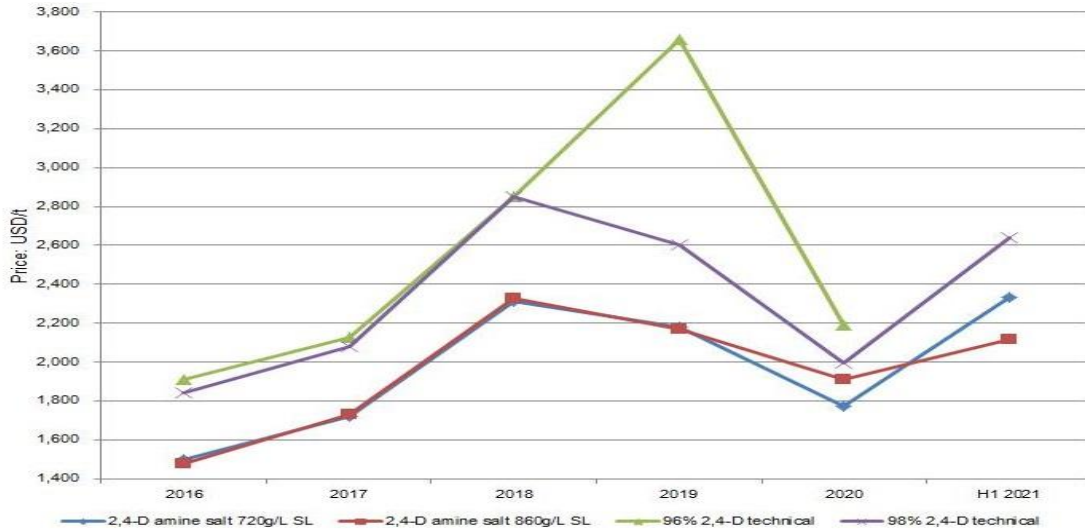
In H1 2021, export prices of China's 2,4-D technical and formulation products saw significant year-on-year increases; average export prices of the main formulations—2,4-D amine salt 720g/L SL and 2,4-D amine salt 860g/L—were USD2,335/t and USD2,116/t, respectively, witnessing double-digit increases over the 2020 averages. Regarding 98% 2,4-D technical, the average export price was USD2,641/t in 2021, increased by 16% compared with the average in 2016–2020.

During 2016–2020, export prices in 2016 were the lowest; the export price of 96% 2,4-D technical peaked in 2019 while prices of the other three peaked in 2018. On average, in these five years, export prices for the four specific varieties were USD1,897/t, USD1,924/t, USD2,548/t and USD2,273/t, respectively. Compared with such figures, prices of 96% 2,4-D technical and 98% 2,4-D technical in 2020 saw double-digit decreases from the average, and the prices of 2,4-D amine salt 720g/L SL, 2,4-D amine salt 860g/L SL experienced smaller shrinks in 2020.

In 2020, due to declined demand and shrinking production caused by the COVID-19 pandemic, export prices of 2,4-D technical and formulation products from China all dropped greatly. The annual export prices of 2,4-D amine salt 720g/L SL, 2,4-D amine salt 860g/L SL, 96% 2,4-D technical and 98% 2,4-D technical were USD1,773/t, USD1,910/t, USD2,185/t and USD1,994/t, representing year-on-year decreases of 19%, 12%, 40% and 23%, respectively.

In 2019, with recovered supply, the export prices of most domestic 2,4-D technical and formulation products experienced decline. In 2018, some 2,4-D producers suspended production due to strict environmental protection policies, resulting in supply shortage and corresponding export price gains. Previously in 2016, the export prices of 2,4-D technical and formulations declined overall because the low quotation of many unlicensed small producers disturbed the market.

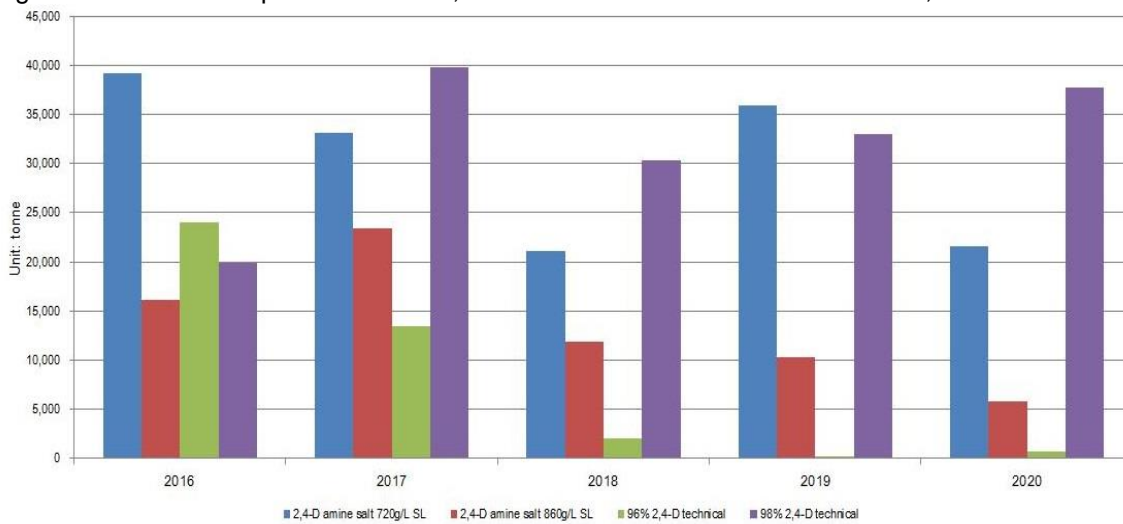
Figure 3.2-1 Annual export price of main specifications of 2,4-D technical and formulations in China, 2016–H1 2021



Source: Tranalysis

- Exports of 2,4-D

Figure 3.2-2 Annual export volume of 2,4-D technical and formulations in China, 2016–2020



Source: Tranalysis

3.2.1 Exports, H1 2021

Table 3.2.1-1 Monthly exports of 2,4-D technical and formulations in China, H1 2021

Month	2,4-D amine salt 600g/L SL		2,4-D amine salt 720g/L SL		2,4-D amine salt 80% SG		2,4-D amine salt 860g/L SL		2,4-D amine salt 96% SG		304g/L SL		95% 2,4-D TC		98% 2,4-D TC		Value, million USD
	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
Jan.	49.589	1.40	848.326	2.14	0.000	/	333.884	1.95	0.000	/	88.049	2.83	15.000	3.96	2,324.470	2.39	8
Feb.	0.000	/	299.107	2.19	0.000	/	367.328	2.06	0.000	/	49.730	2.80	15.000	4.31	1,285.358	2.45	5
March	157.569	2.48	263.505	2.30	0.000	/	29.264	2.60	19.200	3.53	138.393	3.30	0.000	/	3,364.213	2.65	11
April	47.996	1.66	472.236	2.62	0.000	/	182.210	2.10	0.000	/	24.894	2.97	0.000	/	2,208.488	2.81	8
May	66.000	3.17	981.001	2.37	0.000	/	97.750	2.32	0.000	/	110.000	3.44	0.000	/	5,687.801	2.67	18
June	0.000	/	1,341.695	2.37	24.000	4.52	122.767	2.47	0.000	/	175.977	3.89	0.000	/	2,330.140	2.77	11
Total/Ave	321.155	2.33	4,205.870	2.34	24.000	4.52	1,133.204	2.12	19.200	3.53	587.044	3.37	30.000	4.14	17,200.470	2.64	61

Source: Tranalysis

Table 3.2.1-2 Export volume of 2,4-D technical and formulations from China by destination in H1 2021, tonne

No.	Country	2,4-D amine salt 600g/L SL	2,4-D amine salt 720g/L SL	2,4-D amine salt 80% SG	2,4-D amine salt 860g/L SL	2,4-D amine salt 96% SG	304g/L SL	95% 2,4-D TC	98% 2,4-D TC	Total
1	Brazil	0.000	1,920.000	0.000	0.000	0.000	0.000	0.000	9,189.000	11,109.000
2	The US	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3,428.681	3,428.681
3	Argentina	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2,120.201	2,120.201
4	Indonesia	0.000	19.200	0.000	584.720	0.000	0.000	30.000	610.000	1,243.920
5	Mexico	197.054	507.036	24.000	0.000	0.000	344.995	0.000	0.000	1,073.085
6	Ecuador	0.000	328.693	0.000	379.955	0.000	0.000	0.000	153.442	862.090
7	Peru	0.000	554.252	0.000	18.530	0.000	20.340	0.000	0.000	593.122
8	Turkey	0.000	0.000	0.000	0.000	0.000	0.000	0.000	424.000	424.000
9	Uganda	0.000	309.731	0.000	0.000	0.000	0.000	0.000	108.300	418.031
10	Paraguay	0.000	47.619	0.000	0.000	19.200	0.000	0.000	334.000	400.819
11	The Philippines	59.805	60.349	0.000	0.000	0.000	0.000	0.000	204.000	324.155
12	India	0.000	0.000	0.000	0.000	0.000	0.000	0.000	324.006	324.006
13	Nigeria	0.000	284.636	0.000	0.000	0.000	0.000	0.000	0.000	284.636
14	Panama	39.215	0.000	0.000	0.000	0.000	196.086	0.000	0.000	235.302
15	Russia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	228.000	228.000
16	Kenya	0.000	9.398	0.000	149.999	0.000	0.000	0.000	0.000	159.397
17	Bangladesh	25.080	98.011	0.000	0.000	0.000	0.000	0.000	0.000	123.091
18	Costa Rica	0.000	0.000	0.000	0.000	0.000	0.000	0.000	75.600	75.600
19	The Dominican Republic	0.000	25.990	0.000	0.000	0.000	0.000	0.000	0.000	25.990
20	Honduras	0.000	0.000	0.000	0.000	0.000	25.623	0.000	0.000	25.623
	Others	0.000	40.955	0.000	0.000	0.000	0.000	0.000	1.240	42.195
	Total	321.155	4,205.870	24.000	1,133.204	19.200	587.044	30.000	17,200.470	23,520.942

Source: Tranalysis

Table 3.2.1-3 Export volume of 2,4-D technical and formulations from China by exporter in H1 2021, tonne

No.	Exporter	2,4-D amine salt 600g/L SL	2,4-D amine salt 720g/L SL	2,4-D amine salt 80% SG	2,4-D amine salt 860g/L SL	2,4-D amine salt 96% SG	304g/L SL	95% 2,4-D TC	98% 2,4-D TC	Total
1	Jiangxi Tianyu Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8,027.670	8,027.670
2	Ningxia Gerui Fine Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2,902.802	2,902.802
3	Shandong Weifang Rainbow Chemical Co., Ltd.	256.859	1,305.817	24.000	290.735	19.200	297.022	0.000	452.308	2,645.941
4	CAC Shanghai International Trade Co., Ltd.	0.000	1,694.222	0.000	0.000	0.000	0.000	0.000	2,054.400	3,748.622
5	Weihai Hanfu Biochemical Medicine Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	890.000	890.000
6	Red Surcos Trade (Shanghai) Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	589.000	589.000
7	Ningbo Generic Chemical Co., Ltd.	39.215	36.540	0.000	198.400	0.000	18.034	0.000	0.000	292.190
8	Qingdao Greenfield Imp & Exp Co., Ltd.	0.000	0.000	0.000	52.080	0.000	0.000	0.000	234.000	286.080
9	Shanghai Safechem International Trade Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	204.000	204.000
10	Jiangsu Joc Great Wall Corp.	0.000	196.798	0.000	0.000	0.000	0.000	0.000	0.000	196.798
11	Zhejiang Chemicals Import and Export Corp.	0.000	194.424	0.000	0.000	0.000	0.000	0.000	0.000	194.424
12	Ningbo Sunjoy Bioscience Co., Ltd.	0.000	129.696	0.000	0.000	0.000	33.517	0.000	0.000	163.213
13	Nufarm GmbH & Co. KG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	160.000	160.000
14	Sh-Infom Chemical Co., Ltd.	0.000	0.000	0.000	158.720	0.000	0.000	0.000	0.000	158.720
15	China Jiangsu International Economic and Technical Cooperation Group, Ltd.	0.000	25.001	0.000	0.000	0.000	0.000	0.000	126.000	151.001
16	Jiangsu High Hope International Group Corporation	0.000	0.000	0.000	149.999	0.000	0.000	0.000	0.000	149.999
17	CTS Chemical Trading Dmcc	0.000	0.000	0.000	0.000	0.000	0.000	0.000	144.000	144.000

No.	Exporter	2,4-D amine salt 600g/L SL	2,4-D amine salt 720g/L SL	2,4-D amine salt 80% SG	2,4-D amine salt 860g/L SL	2,4-D amine salt 96% SG	304g/L SL	95% 2,4-D TC	98% 2,4-D TC	Total
18	Zhejiang Hengdian Import and Export Co., Ltd.	0.000	50.000	0.000	0.000	0.000	0.000	0.000	72.000	122.000
19	Lier Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	119.925	0.000	0.000	119.925
20	Eastchem Co., Ltd.	0.000	0.675	0.000	111.360	0.000	0.000	0.000	0.000	112.035
Others		25.080	572.696	0.000	171.909	0.000	118.546	30.000	1,344.290	2,262.522
Total		321.155	4,205.870	24.000	1,133.204	19.200	587.044	30.000	17,200.470	23,520.942

Source: Tranalysis

Table 3.2.1-4 Export volume of 2,4-D technical and formulations from China by producer in H1 2021, tonne

No.	Producer	2,4-D amine salt 600g/L SL	2,4-D amine salt 720g/L SL	2,4-D amine salt 80% SG	2,4-D amine salt 860g/L SL	2,4-D amine salt 96% SG	304g/L SL	95% 2,4-D TC	98% 2,4-D TC	Total
1	Jiangxi Tianyu Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8,688.670	8,688.670
2	CAC Nantong Chemical Co., Ltd.	0.000	1,742.222	0.000	0.000	0.000	0.000	0.000	2,078.400	3,820.622
3	Ningxia Gerui Fine Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3,235.110	3,235.110
4	Shandong Weifang Rainbow Chemical Co., Ltd.	256.859	1,282.683	0.000	290.735	19.200	121.045	0.000	125.000	2,095.523
5	Weihai Hanfu Biochemical Medicine Co., Ltd.	0.000	16.800	0.000	0.000	0.000	0.000	0.000	1,114.000	1,130.800
6	Jiangsu CF Agrochemical Co., Ltd.	0.000	275.756	0.000	212.901	0.000	0.000	0.000	0.000	488.657
7	Shandong Keyuan Chemical Industry Co., Ltd.	0.000	0.000	0.000	52.080	0.000	0.000	0.000	258.000	310.080
8	Lier Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	119.925	0.000	0.000	119.925
9	Jingma Chemicals Co., Ltd.	0.000	0.000	0.000	111.360	0.000	0.000	0.000	0.000	111.360
10	Changzhou Wintafone Chemical Co., Ltd.	0.000	85.201	0.000	0.000	0.000	0.000	0.000	0.000	85.201
Others		64.295	803.207	24.000	466.127	0.000	346.074	30.000	1,701.290	3,434.994
Total		321.155	4,205.870	24.000	1,133.204	19.200	587.044	30.000	17,200.470	23,520.942

Source: Tranalysis

3.2.2 Export status in 2020

Table 3.2.2-1 Monthly exports of 2,4-D technical and formulations in China, 2020

Month	2,4-D amine salt 600g/L SL		2,4-D amine salt 720g/L SL		2,4-D amine salt 80% SG		2,4-D amine salt 860g/L SL		2,4-D amine salt 96% SG		95% 2,4-D TC		96% 2,4-D TC		98% 2,4-D TC		Value, million USD
	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
Jan.	421.145	1.80	4,360.019	1.79	0.000	/	445.788	1.94	0.000	/	9.000	3.64	0.000	/	3,861.000	1.90	16
Feb.	134.700	1.56	1,115.422	1.62	20.400	5.26	158.085	1.63	0.000	/	0.000	/	0.000	/	1,087.000	1.83	4
March	904.583	1.93	4,611.041	1.68	19.600	4.69	586.808	1.65	0.000	/	0.000	/	16.000	4.35	5,160.450	1.78	19
April	685.064	2.09	4,838.505	1.65	58.000	3.53	586.089	1.74	9.600	2.77	0.000	/	16.000	4.45	4,758.506	1.80	19
May	445.680	1.60	473.606	3.04	40.000	4.49	344.696	1.88	19.200	2.77	10.000	3.96	549.120	2.05	4,088.809	1.99	12
June	313.739	1.38	1,543.005	1.92	0.000	/	1,631.543	1.95	0.000	/	10.000	3.96	18.000	2.37	1,769.749	2.11	11
July	105.253	1.36	2,442.033	1.93	0.000	/	837.030	1.98	0.000	/	0.000	/	0.000	/	3,500.808	2.12	14
Aug.	46.000	1.55	477.075	1.69	0.000	/	299.631	2.05	0.000	/	10.000	3.96	0.000	/	3,558.053	2.11	9
Sept.	279.029	1.72	587.146	1.77	0.000	/	176.231	1.95	0.000	/	0.000	/	0.000	/	2,898.100	2.07	8
Oct.	13.081	1.44	481.027	1.84	0.000	/	298.850	2.05	0.000	/	10.000	3.96	0.000	/	2,540.450	2.12	7
Nov.	22.084	1.86	294.776	1.83	0.000	/	343.920	2.16	0.000	/	0.000	/	0.000	/	2,175.840	2.17	6
Dec.	25.187	1.39	304.745	1.82	0.000	/	103.846	1.91	0.000	/	0.000	/	0.000	/	2,363.800	2.24	6
Total/Ave	3,395.545	1.79	21,528.401	1.77	138.000	4.23	5,812.517	1.91	28.800	2.77	49.000	3.90	599.120	2.19	37,762.565	1.99	131

Source: Tranalysis

Table 3.2.2-2 Export volume of 2,4-D technical and formulations from China by destination in 2020, tonne

No.	Country	2,4-D amine salt 600g/L SL	2,4-D amine salt 720g/L SL	2,4-D amine salt 80% SG	2,4-D amine salt 860g/L SL	2,4-D amine salt 96% SG	95% 2,4-D TC	96% 2,4-D TC	98% 2,4-D TC	Total
1	Brazil	240.000	4,028.411	0.000	2,454.405	0.000	0.000	489.000	13,742.022	20,953.838
2	Argentina	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5,741.604	5,741.604
3	The US	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5,122.486	5,122.486
4	Indonesia	99.200	121.718	0.000	1,047.040	0.000	49.000	32.000	3,489.600	4,838.558
5	Nigeria	14.400	4,113.011	0.000	0.000	0.000	0.000	0.000	0.000	4,127.411
6	Mexico	1,187.226	181.400	40.000	49.700	0.000	0.000	68.000	656.000	2,182.326
7	Ghana	240.000	1,761.681	0.000	0.000	0.000	0.000	0.000	0.000	2,001.681
8	India	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1,998.000	1,998.000
9	Russia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1,860.720	1,860.720
10	Colombia	0.000	415.919	20.000	160.087	0.000	0.000	0.000	1,134.400	1,730.406
11	Peru	3.600	1,417.552	9.600	132.638	0.000	0.000	0.000	0.000	1,563.390
12	Ecuador	19.760	964.285	0.000	233.448	0.000	0.000	0.000	244.075	1,461.568
13	Paraguay	0.000	126.416	0.000	298.000	19.200	0.000	0.000	851.400	1,295.016
14	Uganda	0.000	1,126.520	0.000	0.000	0.000	0.000	0.000	145.675	1,272.195
15	Guatemala	0.000	425.339	0.000	213.075	0.000	0.000	0.000	460.000	1,098.414
16	The Philippines	232.875	109.504	0.000	0.000	0.000	0.000	10.120	728.800	1,081.300
17	Chile	0.000	880.236	0.000	90.805	0.000	0.000	0.000	0.000	971.041
18	Kazakhstan	252.000	399.934	0.000	0.000	0.000	0.000	0.000	200.000	851.934
19	Thailand	0.000	177.980	0.000	660.616	9.600	0.000	0.000	0.000	848.196
20	Sudan	96.000	659.235	0.000	0.000	0.000	0.000	0.000	0.000	755.235
	Others	1,010.483	4,609.261	68.400	472.703	0.000	0.000	0.000	1,397.783	7,558.630
	Total	3,395.545	21,518.401	138.000	5,812.517	28.800	49.000	599.120	37,772.565	69,313.949

Source: Tranalysis

Table 3.2.2-3 Export volume of 2,4-D technical and formulations from China by exporter in 2020, tonne

No.	Exporter	2,4-D amine salt 600g/L SL	2,4-D amine salt 720g/L SL	2,4-D amine salt 80% SG	2,4-D amine salt 860g/L SL	2,4-D amine salt 96% SG	95% 2,4-D TC	96% 2,4-D TC	98% 2,4-D TC	Total
1	Jiangxi Tianyu Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14,903.451	14,903.451
2	Shandong Weifang Rainbow Chemical Co., Ltd.	1,993.759	5,644.188	98.000	4,155.032	28.800	9.000	338.600	1,296.326	13,563.705
3	CAC Shanghai International Trade Co., Ltd.	0.000	1,003.139	0.000	100.000	0.000	0.000	0.000	7,021.402	8,124.541
4	Ningxia Gerui Fine Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6,186.801	6,186.801
5	Weihai Hanfu Biochemical Medicine Co., Ltd.	0.000	117.120	0.000	0.000	0.000	0.000	0.000	4,394.333	4,511.453
6	CAC Nantong Chemical Co., Ltd.	0.000	3,155.033	0.000	135.488	0.000	0.000	0.000	0.000	3,290.521
7	Agricore Chemical Industry Co., Ltd.	0.000	1,060.030	0.000	0.000	0.000	0.000	0.000	0.000	1,060.030
8	Shandong Kesai Eagrow Co., Ltd.	0.000	849.714	0.000	0.000	0.000	0.000	0.000	0.000	849.714
9	Ningbo Generic Chemical Co., Ltd.	45.815	628.267	0.000	0.000	0.000	0.000	0.000	135.000	809.082
10	Shanghai E-tong Chemical Co., Ltd.	193.740	361.872	0.000	71.045	0.000	0.000	0.000	54.000	680.657
11	Zhejiang Chemicals Import and Export Corp.	102.494	278.053	0.000	0.000	0.000	0.000	0.000	218.075	598.622
12	Jiangsu Trustchem Co., Ltd.	0.000	318.293	0.000	272.000	0.000	0.000	0.000	0.000	590.293
13	Agrohao Co., Ltd.	0.000	539.231	0.000	0.000	0.000	0.000	0.000	36.000	575.231
14	Eastchem Co., Ltd.	0.000	0.000	0.000	533.220	0.000	0.000	0.000	36.000	569.220
15	Zhuochen Industries (Shanghai) Co., Ltd.	0.000	190.638	0.000	0.000	0.000	0.000	0.000	370.000	560.638
16	Shanghai Hui Song (H&S) Agro-Solution Co., Ltd.	0.000	557.226	0.000	0.000	0.000	0.000	0.000	0.000	557.226
17	Shenzhen Baocheng Chemical Industry Co., Ltd.	352.000	180.000	0.000	0.000	0.000	0.000	0.000	0.000	532.000
18	Shanghai Safechem International Trade Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	488.000	488.000
19	Ningbo Sunjoy Bioscience Co., Ltd.	46.800	415.288	0.000	0.000	0.000	0.000	0.000	0.000	462.088
20	Shandong Binnong Technology Co., Ltd.	0.000	356.466	0.000	4.810	0.000	0.000	0.000	0.000	361.276
	Others	660.936	5,863.843	40.000	540.922	0.000	40.000	260.520	2,633.178	10,039.399
	Total	3,395.545	21,518.401	138.000	5,812.517	28.800	49.000	599.120	37,772.565	69,313.949

Source: Tranalysis

Table 3.2.2-4 Export volume of 2,4-D technical and formulations from China by producer in 2020, tonne

No.	Producer	2,4-D amine salt 600g/L SL	2,4-D amine salt 720g/L SL	2,4-D amine salt 80% SG	2,4-D amine salt 860g/L SL	2,4-D amine salt 96% SG	95% 2,4-D TC	96% 2,4-D TC	98% 2,4-D TC	Total
1	Jiangxi Tianyu Chemical Co., Ltd.	0.000	39.675	0.000	0.000	0.000	0.000	0.000	15,401.651	15,441.326
2	Shandong Weifang Rainbow Chemical Co., Ltd.	2,090.367	5,705.864	98.000	4,155.032	28.800	9.000	0.000	942.126	13,029.189
3	CAC Nantong Chemical Co., Ltd.	0.000	2,316.927	0.000	100.000	0.000	0.000	0.000	5,896.402	8,313.329
4	Ningxia Gerui Fine Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6,595.001	6,595.001
5	Weihai Hanfu Biochemical Medicine Co., Ltd.	33.600	575.731	0.000	0.000	0.000	0.000	0.000	5,182.433	5,791.764
6	Nantong Taihe Chemical Industry Co., Ltd.	0.000	2,025.264	0.000	135.488	0.000	0.000	0.000	1,125.000	3,285.752
7	Shandong Keyuan Chemical Industry Co., Ltd.	0.000	1,107.140	0.000	73.000	0.000	0.000	0.000	358.000	1,538.140
8	Jiangsu CF Agrochemical Co., Ltd.	355.600	931.726	0.000	0.000	0.000	0.000	0.000	60.000	1,347.326
9	Changzhou Wintafone Chemical Co., Ltd.	16.800	702.700	0.000	63.920	0.000	0.000	10.120	36.000	829.540
10	Jingma Chemicals Co., Ltd.	0.000	287.252	0.000	533.220	0.000	0.000	0.000	0.000	820.472
	Others	899.178	7,826.122	40.000	751.857	0.000	40.000	589.000	2,175.953	12,322.110
	Total	3,395.545	21,518.401	138.000	5,812.517	28.800	49.000	599.120	37,772.565	69,313.949

Source: Tranalysis

3.2.3 Export status in 2019

Table 3.2.3-1 Monthly exports of 2,4-D technical and formulations in China, 2019

Month	2,4-D amine salt 600g/L SL		2,4-D amine salt 720g/L SL		2,4-D amine salt 80% SG		2,4-D amine salt 860g/L SL		2,4-D amine salt 96% SG		95% 2,4-D TC		96% 2,4-D TC		98% 2,4-D TC		Value, million USD
	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
Jan.	87.522	2.52	3,207.022	2.47	0.000	/	1,142.049	2.36	0.000	/	0.000	/	0.000	/	1,579.903	3.16	16
Feb.	36.160	1.80	2,727.333	2.47	0.000	/	1,082.686	2.38	0.000	/	0.000	/	0.000	/	1,757.100	3.19	15
March	217.652	2.64	3,167.068	2.43	0.000	/	1,115.442	2.26	20.000	4.45	40.200	3.44	0.000	/	1,968.200	3.11	17
April	336.040	2.23	1,937.733	2.41	0.000	/	1,020.174	2.28	29.520	4.42	0.000	/	0.000	/	3,310.400	2.85	17
May	457.645	2.23	4,579.922	2.32	0.000	/	280.589	2.27	0.000	/	0.000	/	16.000	4.45	4,078.100	2.77	24
June	631.139	2.10	3,081.210	2.29	0.000	/	748.428	2.24	0.000	/	0.000	/	0.000	/	4,108.110	2.68	21
July	643.081	2.01	3,434.545	2.24	0.000	/	1,733.496	2.12	0.000	/	0.000	/	44.200	3.33	3,276.603	2.57	21
Aug.	365.408	1.72	2,368.796	2.08	0.000	/	1,376.170	2.01	0.000	/	0.000	/	28.600	3.73	4,596.680	2.42	20
Sept.	351.947	1.84	2,252.092	2.08	0.000	/	261.399	1.93	20.000	4.35	0.000	/	0.000	/	3,335.400	2.18	13
Oct.	295.685	1.70	2,500.357	1.82	13.920	4.76	363.851	2.04	0.000	/	28.600	2.93	0.000	/	1,813.800	2.14	10
Nov.	573.060	1.56	3,225.372	1.73	67.260	4.79	384.574	1.97	15.360	3.10	0.000	/	0.000	/	1,385.300	2.09	10
Dec.	453.403	1.76	3,440.428	1.77	0.000	/	750.901	1.82	0.000	/	0.000	/	0.000	/	1,803.925	2.04	12
Total/Ave	4,448.742	1.96	35,921.878	2.18	81.180	4.79	10,259.759	2.17	84.880	4.17	68.800	3.23	88.800	3.66	33,013.521	2.60	196

Source: Tranalysis

Table 3.2.3-2 Export volume of 2,4-D technical and formulations from China by destination in 2019, tonne

No.	Country	2,4-D amine salt 600g/L SL	2,4-D amine salt 720g/L SL	2,4-D amine salt 80% SG	2,4-D amine salt 860g/L SL	2,4-D amine salt 96% SG	95% 2,4-D TC	96% 2,4-D TC	98% 2,4-D TC
1	Brazil	0.000	268.812	0.000	2,325.397	0.000	0.000	0.000	8,537.916
2	The US	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5,346.000
3	Argentina	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4,251.200
4	Colombia	19.200	970.624	17.000	281.348	0.000	0.000	0.000	3,206.000
5	India	40.950	0.000	0.000	0.000	0.000	0.000	0.000	2,504.000
6	Indonesia	101.680	563.275	0.000	1,264.060	0.000	0.000	88.800	2,284.000
7	Russia	0.000	11.100	0.000	0.000	0.000	0.000	0.000	1,584.000
8	Guatemala	0.000	255.268	0.000	134.808	0.000	0.000	0.000	1,551.975
9	Malaysia	10.122	340.049	4.320	2.964	0.000	7.000	0.000	844.000
10	Paraguay	0.000	565.834	0.000	21.600	15.360	0.000	0.000	826.600
11	Turkey	54.679	294.477	0.000	0.000	0.000	0.000	0.000	665.700
12	South Africa	1,048.303	405.440	0.000	0.000	0.000	0.000	0.000	363.000
13	The Philippines	230.863	597.688	0.000	46.656	0.000	0.000	0.000	260.000
14	Ecuador	0.000	950.344	0.000	731.092	0.000	0.000	0.000	196.500
15	Costa Rica	0.000	474.278	0.000	34.490	0.000	0.000	0.000	185.000
16	Mexico	333.485	0.000	40.000	19.760	40.000	0.000	0.000	124.000
17	Uruguay	203.040	1,062.659	0.000	128.140	19.200	0.000	0.000	88.550
18	Uganda	10.800	688.054	0.000	0.000	0.000	0.000	0.000	66.000
19	Thailand	457.320	1,052.982	0.000	2,776.357	0.000	57.800	0.000	41.080
20	Croatia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	25.000
	Others	1,938.300	27,420.994	19.860	2,493.087	10.320	4.000	0.000	63.000
	Total	4,448.742	35,921.878	81.180	10,259.759	84.880	68.800	88.800	33,013.521

Source: Tranalysis

Table 3.2.3-3 Export volume of 2,4-D technical and formulations from China by exporter in 2019, tonne

No.	Exporter	2,4-D amine salt 600g/L SL	2,4-D amine salt 720g/L SL	2,4-D amine salt 80% SG	2,4-D amine salt 860g/L SL	2,4-D amine salt 96% SG	95% 2,4- D TC	96% 2,4- D TC	98% 2,4-D TC	Total
1	Jiangxi Tianyu Chemical Co., Ltd.	0.000	0.012	0.000	0.000	0.000	0.000	0.000	16,865.016	16,865.028
2	Shandong Weifang Rainbow Chemical Co., Ltd.	1,706.671	2,609.802	41.180	6,757.163	64.880	68.800	0.000	1,090.580	12,339.076
3	Ningxia Gerui Fine Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5,107.875	5,107.875
4	CAC Nantong Chemical Co., Ltd.	0.000	3,461.736	0.000	60.540	0.000	0.000	0.000	0.000	3,522.276
5	Shanghai CAC International Trade Co., Ltd.	0.000	363.016	0.000	0.000	0.000	0.000	0.000	2,066.000	2,429.016
6	Shenzhen Baocheng Chemical Industry Co., Ltd.	1,037.000	696.000	0.000	283.200	0.000	0.000	0.000	0.000	2,016.200
7	Jiangsu CF Agrochemical Co., Ltd.	0.000	1,929.328	0.000	0.000	0.000	0.000	0.000	0.000	1,929.328
8	Shanghai Lianrui Chemical Co., Ltd.	0.000	1,712.637	0.000	0.000	0.000	0.000	0.000	0.000	1,712.637
9	Ningbo Generic Chemical Co., Ltd.	110.598	1,343.512	0.000	22.240	0.000	0.000	0.000	72.000	1,548.350
10	Jiangsu Trustchem Co., Ltd.	29.280	1,339.000	0.000	0.002	0.000	0.000	0.000	9.000	1,377.282
11	Weihai Hanfu Biochemical Medicine Co., Ltd.	0.000	0.000	0.000	19.200	0.000	0.000	0.000	1,119.000	1,138.200
12	Shandong Binnong Technology Co., Ltd.	26.403	893.678	0.000	48.290	0.000	0.000	0.000	148.800	1,117.171
13	Red Surcos Trade (Shanghai) Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1,068.000	1,068.000
14	Changzhou Wintafone Chemical Co., Ltd.	0.000	1,032.869	0.000	0.000	0.000	0.000	0.000	0.000	1,032.869

No.	Exporter	2,4-D amine salt 600g/L SL	2,4-D amine salt 720g/L SL	2,4-D amine salt 80% SG	2,4-D amine salt 860g/L SL	2,4-D amine salt 96% SG	95% 2,4- D TC	96% 2,4- D TC	98% 2,4-D TC	Total
15	Ningbo Sanyi Biotechnology Co., Ltd.	0.000	872.313	0.000	152.233	0.000	0.000	0.000	0.000	1,024.546
16	Shanghai Agrohao International Trade Co., Ltd.	0.000	922.538	0.000	0.000	0.000	0.000	0.000	36.000	958.538
17	Shanghai Psyche Chemicals Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	870.000	870.000
18	Guangdong Keywa Chemical Exchange Center Stock Co., Ltd.	0.000	322.574	0.000	53.670	0.000	0.000	0.000	360.800	737.044
19	Shandong Kesai Eagrow Chemical Co., Ltd.	0.000	686.740	0.000	0.000	0.000	0.000	0.000	0.000	686.740
20	Eastchem Co., Ltd.	0.000	0.000	0.000	636.904	0.000	0.000	0.000	22.000	658.904
Others		1,538.790	17,736.123	40.000	2,226.317	20.000	0.000	88.800	4,178.450	25,828.480
Total		4,448.742	35,921.878	81.180	10,259.759	84.880	68.800	88.800	33,013.521	83,967.560

Source: Tranalysis

Table 3.2.3-4 Export volume of 2,4-D technical and formulations from China by producer in 2019, tonne

No.	Producer	2,4-D amine salt 600g/L SL	2,4-D amine salt 720g/L SL	2,4-D amine salt 80% SG	2,4-D amine salt 860g/L SL	2,4-D amine salt 96% SG	95% 2,4-D TC	96% 2,4-D TC	98% 2,4-D TC	Total
1	Jiangxi Tianyu Chemical Co., Ltd.	0.000	1,556.569	0.000	0.000	0.000	0.000	0.000	18,209.016	19,765.585
2	Shandong Weifang Rainbow Chemical Co., Ltd.	1,706.671	2,681.626	41.180	6,757.163	64.880	68.800	0.000	1,115.580	12,435.900
3	Jiangsu CF Agrochemical Co., Ltd.	1,126.600	5,642.176	0.000	453.915	0.000	0.000	0.000	353.600	7,576.291
4	Weihai Hanfu Biochemical Medicine Co., Ltd.	132.838	1,223.257	0.000	463.591	0.000	0.000	0.000	3,321.050	5,140.736
5	Ningxia Gerui Fine Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5,107.875	5,107.875
6	Nantong Taihe Chemical Industry Co., Ltd.	15.600	3,916.391	0.000	60.540	0.000	0.000	0.000	98.000	4,090.531
7	Changzhou Wintafone Chemical Co., Ltd.	73.760	2,836.613	0.000	159.630	0.000	0.000	0.000	73.900	3,143.903
8	Shandong Keyuan Chemical Industry Co., Ltd.	46.304	2,023.206	40.000	194.893	20.000	0.000	0.000	364.400	2,688.803
9	Jingma Chemicals Co., Ltd.	16.358	1,271.555	0.000	712.264	0.000	0.000	0.000	273.200	2,273.377
10	Nanjing CF Agrochemical Co., Ltd.	104.800	1,082.046	0.000	205.600	0.000	0.000	0.000	0.000	1,392.446
	Others	1,225.811	13,688.439	0.000	1,252.163	0.000	0.000	88.800	4,096.900	20,352.113
	Total	4,448.742	35,921.878	81.180	10,259.759	84.880	68.800	88.800	33,013.521	83,967.560

Source: Tranalysis

3.2.4 Export status in 2018

Table 3.2.4-1 Monthly exports of 2,4-D technical and formulations in China, 2018

Month	2,4-D amine salt 600g/L SL		2,4-D amine salt 720g/L SL		2,4-D amine salt 860g/L SL		2,4-D amine salt 96% SG		96% 2,4-D technical		98% 2,4-D technical		Value, million USD
	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
Jan.	198.441	1.91	1,703.291	1.91	1,473.264	2.08	0.000	/	888.600	2.64	3,471.360	2.45	18
Feb.	245.800	2.15	892.572	2.13	661.215	2.41	0.000	/	154.000	2.81	2,145.200	2.57	10
March	238.814	2.50	984.506	2.06	878.209	2.20	0.000	/	54.000	2.90	2,248.540	2.69	11
April	207.418	2.51	2,285.075	2.36	1,211.989	2.42	57.600	4.30	267.000	2.89	3,006.755	2.78	18
May	763.836	2.14	2,714.214	2.37	2,104.668	2.31	12.690	5.40	250.000	2.97	3,827.600	2.84	25
June	454.333	2.07	1,151.974	2.29	839.856	2.28	35.700	5.14	16.000	4.37	3,126.008	2.88	15
July	390.958	2.20	1,691.804	2.38	1,023.945	2.29	0.000	/	213.650	3.00	2,245.800	3.01	15
Aug.	354.413	1.92	1,303.430	2.29	736.514	2.47	0.000	/	51.000	3.02	2,459.742	2.96	13
Sept.	241.188	2.18	2,464.626	2.31	838.183	2.60	0.000	/	50.400	3.15	2,579.600	2.97	16
Oct.	146.944	2.10	1,837.053	2.39	489.259	2.38	0.000	/	0.000	/	1,934.400	3.15	12
Nov.	7.200	2.81	1,619.570	2.45	766.832	2.45	0.000	/	0.000	/	1,750.800	3.22	11
Dec.	144.241	2.74	2,480.475	2.43	854.297	2.34	0.000	/	29.800	4.87	1,537.400	3.15	13
Total/Ave	3,393.586	2.18	21,128.590	2.31	11,878.231	2.33	105.990	4.72	1,974.450	2.85	30,333.205	2.85	177

Source: Tranalysis

Table 3.2.4-2 Export volume of 2,4-D technical and formulations from China by destination in 2018, tonne

No.	Country	2,4-D amine salt 600g/L SL	2,4-D amine salt 720g/L SL	2,4-D amine salt 860g/L SL	2,4-D amine salt 96% SG	96% 2,4-D TC	98% 2,4-D TC
1	The US	0.000	0.000	0.000	0.000	470.400	7,157.220
2	Brazil	0.000	0.000	0.000	0.000	574.000	6,007.200
3	Indonesia	376.525	586.880	776.360	0.000	68.000	3,950.555
4	India	10.168	0.000	0.000	0.000	0.000	2,760.000
5	Argentina	0.000	0.000	0.000	0.000	129.000	2,260.800
6	Colombia	0.000	268.366	266.059	6.000	40.000	1,530.000
7	The Philippines	149.571	382.011	91.840	0.000	75.000	1,090.000
8	Paraguay	0.000	67.200	77.120	57.600	70.400	1,082.400
9	Guatemala	0.000	19.840	195.519	5.490	0.000	730.000
10	Russia	41.976	95.520	0.000	0.000	214.200	726.000
11	Malaysia	18.075	9.360	169.600	7.200	0.000	609.400
12	Mexico	956.044	38.400	138.320	20.000	26.000	538.000
13	Australia	76.514	99.276	31.960	0.000	0.000	382.400
14	Cuba	0.000	192.000	0.000	0.000	0.000	360.000
15	South Africa	660.983	114.464	269.440	0.000	0.000	288.600
16	Ecuador	0.000	755.088	601.966	0.000	60.000	222.000
17	Myanmar	24.800	106.986	96.640	0.000	0.000	117.742
18	Thailand	123.500	804.882	3,312.898	0.100	0.000	91.520
19	The Netherlands	0.000	0.000	0.000	0.000	0.000	90.000
20	Turkey	15.552	74.575	18.089	0.000	20.000	69.200
	Others	939.878	17,513.742	5,832.420	9.600	227.450	270.168
	Total	3,393.586	21,128.590	11,878.231	105.990	1,974.450	30,333.205

Source: Tranalysis

Table 3.2.4-3 Export volume of 2,4-D technical and formulations from China by exporter in 2018, tonne

No.	Exporter	2,4-D amine salt 600g/L SL	2,4-D amine salt 720g/L SL	2,4-D amine salt 860g/L SL	2,4-D amine salt 96% SG	96% 2,4-D TC	98% 2,4-D TC	Total
1	Jiangxi Tianyu Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	13,752.800	13,752.800
2	Shandong Weifang Rainbow Chemical Co., Ltd.	1,776.512	1,401.402	3,806.113	105.990	0.000	2,108.940	9,198.957
3	Ningxia Gerui Fine Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	2,674.400	2,674.400
4	Jiangsu CF Agrochemical Co., Ltd.	0.000	1,728.660	0.000	0.000	0.000	0.000	1,728.660
5	Guangdong Keywa Chemical Exchange Center Stock Co., Ltd.	0.000	111.660	86.495	0.000	0.000	1,467.400	1,665.555
6	Ningbo Generic Chemical Co., Ltd.	19.840	642.477	481.673	0.000	273.200	25.800	1,442.990
7	Shanghai Psyche Chemicals Co., Ltd.	0.000	0.000	0.000	0.000	0.000	1,350.000	1,350.000
8	Weihai Hanfu Biochemical Medicine Co., Ltd.	0.000	0.000	0.000	0.000	0.000	1,302.000	1,302.000
9	Jadesheen Chemical Co., Ltd.	2.400	525.473	498.788	0.000	0.000	231.000	1,257.661
10	Shanghai Eastsun Chemical Co., Ltd.	0.000	1,235.752	0.000	0.000	0.000	0.000	1,235.752
11	Red Surcos Trade (Shanghai) Co., Ltd.	0.000	0.000	0.000	0.000	0.000	1,188.000	1,188.000
12	Shanghai Safechem International Trade Co., Ltd.	0.000	0.000	0.000	0.000	75.000	1,090.000	1,165.000
13	Shandong Keyuan Chemical Industry Co., Ltd.	0.000	123.793	710.240	0.000	0.000	306.000	1,140.033
14	High Hope Zhongtian Corporation	0.000	164.328	763.680	0.000	0.000	172.000	1,100.008
15	Ninghua Group Co., Ltd.	57.600	473.132	456.273	0.000	0.000	0.000	987.005
16	Shanghai CAC International Trade Co., Ltd.	0.000	881.664	0.000	0.000	0.000	40.000	921.664
17	Shenzhen Iprochem Co., Ltd.	0.000	504.020	97.824	0.000	0.000	175.200	777.044
18	Nanjing Redsun Group International Trade Co., Ltd.	0.000	144.400	219.611	0.000	0.000	408.800	772.811
19	Jiangsu Huifeng Agrochemical Co., Ltd.	0.000	765.586	0.000	0.000	0.000	0.000	765.586
20	JOC Yuntai International Trading Co., Ltd.	0.000	0.000	0.000	0.000	404.000	355.000	759.000
	Others	1,537.234	12,426.243	4,757.534	0.000	1,222.250	3,685.865	23,629.126
	Total	3,393.586	21,128.590	11,878.231	105.990	1,974.450	30,333.205	68,814.052

Source: Tranalysis

Table 3.2.4-4 Export volume of 2,4-D technical and formulations from China by producer in 2018, tonne

No.	Producer	2,4-D amine salt 600g/L SL	2,4-D amine salt 720g/L SL	2,4-D amine salt 860g/L SL	2,4-D amine salt 96% SG	96% 2,4-D TC	98% 2,4-D TC	Total
1	Jiangxi Tianyu Chemical Co., Ltd.	0.000	463.681	78.804	0.000	0.000	15,357.200	15,899.685
2	Shandong Weifang Rainbow Chemical Co., Ltd.	1,776.512	1,401.402	3,806.113	105.990	0.000	2,228.940	9,318.957
3	Weihai Hanfu Biochemical Medicine Co., Ltd.	3.420	1,037.139	1,812.837	0.000	20.000	5,178.400	8,051.796
4	Jiangsu Huifeng Agrochemical Co., Ltd.	22.240	2,978.178	967.122	0.000	0.000	125.560	4,093.100
5	Changzhou Wintafone Chemical Co., Ltd.	57.600	2,052.206	759.764	0.000	1,099.800	58.000	4,027.370
6	Jiangsu CF Agrochemical Co., Ltd.	57.650	2,709.426	436.204	0.000	40.000	434.800	3,678.080
7	Shandong Keyuan Chemical Industry Co., Ltd.	566.738	797.916	1,133.111	0.000	0.000	1,079.155	3,576.920
8	Jingma Chemicals Co., Ltd.	14.400	1,984.810	149.195	0.000	168.000	870.350	3,186.755
9	Ningxia Gerui Fine Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	2,554.400	2,554.400
10	CAC Nantong Chemical Co., Ltd.	0.000	2,157.100	195.120	0.000	0.000	0.000	2,352.220
	Others	895.026	5,546.732	2,539.961	0.000	646.650	2,446.400	12,074.769
	Total	3,393.586	21,128.590	11,878.231	105.990	1,974.450	30,333.205	68,814.052

Source: Tranalysis

3.2.5 Export status in 2017

Table 3.2.5-1 Monthly exports of 2,4-D technical and formulations in China, 2017

Month	2,4-D amine salt 600g/L SL		2,4-D amine salt 720g/L SL		2,4-D amine salt 860g/L SL		2,4-D amine salt 96% SG		96% 2,4-D technical		98% 2,4-D technical		Value, million USD
	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
Jan.	262.102	1.63	3,224.175	1.62	1,635.273	1.52	34.000	3.63	868.737	2.00	3,414.179	1.93	17
Feb.	190.765	1.60	2,744.078	1.63	975.849	1.51	4.800	2.94	489.700	1.99	2,375.651	2.00	12
March	150.505	2.16	3,488.842	1.67	1,690.686	1.63	16.440	4.57	1,824.275	1.97	4,195.470	1.93	21
April	242.852	1.93	2,981.200	1.75	2,307.134	1.64	25.920	4.29	1,424.650	1.99	3,042.400	2.01	19
May	284.511	2.00	3,079.453	1.63	2,614.633	1.61	1.970	3.74	1,308.800	1.95	3,112.400	2.07	19
June	417.823	1.52	3,301.437	1.70	1,933.131	1.71	0.000	/	785.100	1.97	3,666.750	2.01	18
July	469.405	1.56	2,215.377	1.56	2,967.251	1.68	0.000	/	697.200	2.00	3,746.280	1.95	18
Aug.	252.171	1.56	2,148.319	1.67	1,998.725	1.93	12.800	3.81	1,243.180	2.05	3,530.242	2.01	18
Sept.	185.614	1.65	2,028.211	1.76	1,622.461	1.73	0.000	/	869.100	2.22	2,424.500	2.04	14
Oct.	66.480	1.83	2,278.170	1.85	1,290.634	1.81	20.400	4.19	1,010.000	2.30	2,317.280	2.16	14
Nov.	144.477	2.06	2,448.596	1.89	2,166.433	1.94	36.000	5.61	1,592.600	2.43	3,944.080	2.33	22
Dec.	561.657	2.03	3,221.997	1.97	2,245.674	1.90	2.100	3.79	1,295.200	2.55	4,037.400	2.41	25
Total/Ave	3,228.362	1.77	33,159.855	1.72	23,447.884	1.73	154.430	4.37	13,408.542	2.13	39,806.632	2.08	215

Source: Tranalysis

Table 3.2.5-2 Export volume of 2,4-D technical and formulations from China by destination in 2017, tonne

No.	Country	2,4-D amine salt 600g/L SL	2,4-D amine salt 720g/L SL	2,4-D amine salt 860g/L SL	2,4-D amine salt 96% SG	96% 2,4-D TC	98% 2,4-D TC
1	The US	0.000	0.000	0.000	0.000	2,216.000	11,540.000
2	Brazil	0.000	0.000	3,611.013	0.000	2,696.600	3,522.402
3	Argentina	0.000	0.000	0.000	0.000	2,913.400	3,501.000
4	Russia	0.000	138.680	19.200	0.000	192.600	3,191.700
5	Australia	672.805	896.436	129.689	0.000	76.500	2,981.600
6	Indonesia	19.840	1,018.260	1,492.136	0.000	1,089.000	2,785.120
7	India	0.000	19.200	0.000	0.000	200.000	2,734.000
8	Vietnam	0.000	518.715	2,108.084	0.000	0.000	2,695.871
9	Guatemala	0.000	196.416	376.340	1.970	828.000	1,568.700
10	The Philippines	0.000	282.260	0.000	0.000	72.000	1,094.000
11	South Africa	615.575	238.928	263.360	0.000	18.400	970.000
12	Costa Rica	0.000	226.554	192.000	0.000	658.000	866.800
13	Mexico	782.818	299.880	118.560	15.000	34.000	778.200
14	Malaysia	19.280	9.280	622.640	24.240	747.800	435.000
15	Ecuador	0.000	856.856	613.961	0.000	126.000	296.000
16	Turkey	25.262	5.640	0.000	0.000	415.180	291.580
17	Myanmar	7.000	67.214	481.060	0.000	0.000	127.760
18	Colombia	3.399	891.743	1,371.326	88.000	152.000	96.000
19	Paraguay	0.000	402.399	109.009	0.000	472.000	84.000
20	Uruguay	140.210	2,245.034	542.992	0.000	65.700	77.000
	Others	942.173	24,846.360	11,396.514	25.220	435.362	169.899
	Total	3,228.362	33,159.855	23,447.884	154.430	13,408.542	39,806.632

Source: Tranalysis

Table 3.2.5-3 Export volume of 2,4-D technical and formulations from China by exporter in 2017, tonne

No.	Exporter	2,4-D amine salt 600g/L SL	2,4-D amine salt 720g/L SL	2,4-D amine salt 860g/L SL	2,4-D amine salt 96% SG	96% 2,4-D TC	98% 2,4-D TC	Total
1	Shandong Weifang Rainbow Chemical Co., Ltd.	2,016.077	3,312.437	6,016.257	154.430	0.000	8,452.800	19,952.001
2	Jiangxi Tianyu Chemical Co., Ltd.	0.000	460.200	0.000	0.000	0.000	12,641.802	13,102.002
3	Jiangsu Huifeng Agrochemical Co., Ltd.	0.000	4,077.659	308.350	0.000	0.000	0.000	4,386.009
4	Jingma Chemicals Co., Ltd.	96.480	38.400	298.784	0.000	3,550.800	256.000	4,240.464
5	Ningxia Gerui Fine Chemical Co., Ltd.	0.000	0.000	0.000	0.000	0.000	3,726.400	3,726.400
6	Eastchem Co., Ltd.	0.000	118.560	675.420	0.000	0.000	2,504.087	3,298.067
7	Guangdong Keywa Chemical Exchange Center Stock Co., Ltd.	0.000	167.504	1,244.746	0.000	496.400	869.250	2,777.900
8	JOC Yuntai International Trading Co., Ltd.	0.000	16.818	0.000	0.000	2,724.000	0.000	2,740.818
9	Haoyuan Industries (Shanghai) Co., Ltd.	0.000	57.600	197.760	0.000	1,338.600	954.000	2,547.960
10	Ningbo Generic Chemical Co., Ltd.	170.978	478.811	592.816	0.000	920.775	23.000	2,186.380
11	Shenzhen Baocheng Chemical Industry Co., Ltd.	0.000	2,030.400	60.000	0.000	0.000	0.000	2,090.400
12	Shandong Keyuan Chemical Industry Co., Ltd.	0.000	0.000	1,803.372	0.000	0.000	180.000	1,983.372
13	Ninghua Group Co., Ltd.	7.200	838.266	946.602	0.000	0.000	160.000	1,952.068
14	Zhangjiagang Rongjiayike Trade Co., Ltd.	0.000	0.000	0.000	0.000	905.600	806.400	1,712.000
15	Ningbo Tide Import and Export Co., Ltd.	0.000	25.158	1,078.656	0.000	0.000	428.400	1,532.214

No.	Exporter	2,4-D amine salt 600g/L SL	2,4-D amine salt 720g/L SL	2,4-D amine salt 860g/L SL	2,4-D amine salt 96% SG	96% 2,4-D TC	98% 2,4-D TC	Total
16	Nanjing Redsun Group International Trade Co., Ltd.	0.000	231.836	658.234	0.000	18.000	496.000	1,404.070
17	Nutrichem Company Limited	0.000	0.000	0.000	0.000	1,310.400	0.000	1,310.400
18	Changzhou Wintafone Chemical Co., Ltd.	0.000	1,238.400	17.360	0.000	0.000	0.000	1,255.760
19	Shanghai Hanfu Biotechnology Co., Ltd.	0.000	429.600	89.424	0.000	0.000	727.000	1,246.024
20	Shanghai Safechem International Trade Co., Ltd.	0.000	0.000	0.000	0.000	72.000	1,094.000	1,166.000
Others		937.627	19,638.206	9,460.103	0.000	2,071.967	6,487.493	38,595.396
Total		3,228.362	33,159.855	23,447.884	154.430	13,408.542	39,806.632	113,205.705

Source: Tranalysis

Table 3.2.5-4 Export volume of 2,4-D technical and formulations from China by producer in 2017, tonne

No.	Producer	2,4-D amine salt 600g/L SL	2,4-D amine salt 720g/L SL	2,4-D amine salt 860g/L SL	2,4-D amine salt 96% SG	96% 2,4-D TC	98% 2,4-D TC	Total
1	Shandong Weifang Rainbow Chemical Co., Ltd.	2,016.077	3,312.437	6,016.257	154.430	0.000	12,179.200	23,678.401
2	CAC Nantong Chemical Co., Ltd.	100.995	5,001.835	454.224	0.000	1,127.600	14,427.802	21,112.456
3	Jiangsu Huifeng Agrochemical Co., Ltd.	0.000	9,578.522	2,607.540	0.000	0.000	1,272.326	13,458.388
4	Weihai Hanfu Biochemical Medicine Co., Ltd.	0.000	1,483.820	5,775.563	0.000	61.000	5,840.400	13,160.783
5	Changzhou Wintafone Chemical Co., Ltd.	0.000	4,207.436	864.576	0.000	5,336.417	759.330	11,167.759
6	Shandong Keyuan Chemical Industry Co., Ltd.	0.000	640.168	2,924.440	0.000	758.000	3,845.974	8,168.582
7	Nanjing CF Agrochemical Co., Ltd.	0.360	4,764.502	3,148.880	0.000	180.775	0.000	8,094.517
8	Jingma Chemicals Co., Ltd.	0.000	545.860	417.784	0.000	4,657.400	292.000	5,913.044
9	Shandong Qiaochang Chemical Co., Ltd.	0.000	1,291.273	244.068	0.000	673.200	0.000	2,208.541
10	Anhui Xinglong Chemical Co., Ltd.	1,025.490	69.438	391.088	0.000	88.000	105.600	1,679.616
	Others	85.440	2,264.564	603.464	0.000	526.150	1,084.000	4,563.618
	Total	3,228.362	33,159.855	23,447.884	154.430	13,408.542	39,806.632	113,205.705

Source: Tranalysis

3.2.6 Export status in 2016

Table 3.2.6-1 Monthly exports of 2,4-D technical and formulations in China, 2016

Month	2,4-D amine salt 720g/L SL		2,4-D amine salt 860g/L SL		96% 2,4-D technical		98% 2,4-D technical		Value, million USD
	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	Volume, tonne	Price, USD/kg	
Jan.	4,636.187	1.49	393.308	1.75	1,886.400	1.80	2,185.820	2.12	16
Feb.	2,341.654	1.49	743.267	1.84	2,094.440	2.15	457.005	1.98	10
March	4,175.157	1.53	1392.928	1.52	1,649.661	1.84	2,477.470	1.91	16
April	4,436.378	1.47	1610.124	1.49	2,497.220	1.92	1,679.189	1.99	17
May	5,677.608	1.49	1423.310	1.41	2,104.650	1.83	2,701.121	1.84	19
June	3,768.895	1.52	2042.960	1.48	2,091.700	1.86	1,578.936	1.80	15
July	3,348.689	1.49	2221.234	1.43	2,932.198	1.87	1,024.277	1.73	15
Aug.	1,766.212	1.49	2523.503	1.40	1,866.600	1.77	2,170.840	1.73	13
Sept.	1,742.745	1.41	688.798	1.39	1,324.800	1.91	1,120.570	1.66	8
Oct.	2,217.811	1.44	785.405	1.39	1,998.950	2.00	1,566.244	1.57	11
Nov.	2,126.715	1.55	995.442	1.47	1,636.760	2.00	1,534.190	1.78	11
Dec.	2,980.889	1.58	1330.299	1.58	1,879.750	2.00	1,405.800	1.89	13
Total/Ave	39,218.940	1.50	16150.578	1.48	23,963.129	1.91	19,901.462	1.84	165

Source: Tranalysis

Table 3.2.6-2 Export volume of 2,4-D technical and formulations from China by destination in 2016, tonne

No.	Country	2,4-D amine salt 720g/L SL	2,4-D amine salt 860g/L SL	96% 2,4-D TC	98% 2,4-D TC
1	The US	0.000	0.000	5,803.600	4,895.000
2	Brazil	2,841.366	3,233.697	1,347.200	3,624.600
3	Vietnam	515.901	398.616	20.000	2,007.117
4	Russia	136.160	9.600	1,240.150	1,936.750
5	Indonesia	964.820	876.178	2,464.600	1,358.055
6	Cuba	237.349	38.400	0.005	996.208
7	Argentina	142.440	279.390	3,777.000	966.000
8	Mexico	1,167.280	0.000	20.000	755.101
9	The Philippines	160.840	18.240	320.000	584.000
10	Guatemala	198.615	360.898	570.000	576.000
11	South Africa	853.595	79.040	0.000	425.500
12	Australia	2,622.597	165.236	887.800	334.800
13	Turkey	73.670	19.760	600.560	284.820
14	Ecuador	1,209.649	798.479	166.200	202.500
15	Malaysia	41.412	242.048	811.140	188.200
16	Myanmar	144.765	46.665	110.713	186.228
17	Lithuania	18.000	0.000	0.000	180.000
18	Thailand	642.924	2,877.298	158.400	140.800
19	Paraguay	318.295	5.774	662.000	94.000
20	Slovenia	0.000	0.000	32.560	36.000
Others		26,929.262	6,701.259	4,971.201	129.783
Total		39,218.940	16,150.578	23,963.129	19,901.462

Source: Tranalysis

Table 3.2.6-3 Export volume of 2,4-D technical and formulations from China by exporter in 2016, tonne

No.	Exporter	2,4-D amine salt 720g/L SL	2,4-D amine salt 860g/L SL	96% 2,4-D TC	98% 2,4-D TC	Total
1	Shandong Weifang Rainbow Chemical Co., Ltd.	6,213.194	4,274.380	0.000	7,604.426	18,092.000
2	Nutrichem Company Limited	0.000	0.000	3,592.000	874.400	4,466.400
3	Jiangxi Tianyu Chemical Co., Ltd.	0.000	0.000	3,840.050	0.000	3,840.050
4	Shanghai Hanfu Biotechnology Co., Ltd.	0.000	1,024.862	0.000	2,661.820	3,686.682
5	Ningbo Generic Chemical Co., Ltd.	2,368.410	195.103	145.000	58.000	2,766.513
6	Eastchem Co., Ltd.	3.744	0.000	0.000	2,631.212	2,634.956
7	Jiangsu CF Agrochemical Co., Ltd.	2,553.347	0.000	0.000	0.000	2,553.347
8	Jingma Chemicals Co., Ltd.	56.467	236.850	2,186.950	0.000	2,480.267
9	Jiangsu Huifeng Agrochemical Co., Ltd.	2,390.082	50.096	0.000	18.000	2,458.178
10	Ningbo Tide Import and Export Co., Ltd.	25.485	901.600	1,448.200	75.600	2,450.885
11	Zhejiang Hengdian Imp. & Exp. Co., Ltd.	211.687	0.000	1,572.600	120.000	1,904.287
12	Jiangsu Xinneng Plant Protection Co., Ltd.	14.400	0.000	1,833.000	0.000	1,847.400
13	Changzhou Wintafone Chemical Co., Ltd.	1,441.419	315.426	0.000	0.000	1,756.845
14	Guangdong Keywa Chemical Exchange Center Stock Co., Ltd.	236.316	178.360	865.700	279.400	1,559.776
15	Sinochem Agro Co., Ltd.	976.922	148.878	425.000	0.000	1,550.800
16	Ninghua Group Co., Ltd.	1,248.022	191.853	0.000	40.000	1,479.875
17	Jiangyin Yuze Biotechnology Co., Ltd.	314.816	1,115.083	0.000	0.000	1,429.899
18	Shenzhen Baocheng Chemical Industry Co., Ltd.	1,365.800	24.000	0.000	0.000	1,389.800
19	Zhejiang Chemicals Import & Export Corporation	632.030	156.805	0.000	570.400	1,359.235
20	CAC Nantong Chemical Co., Ltd.	570.070	0.000	760.000	0.000	1,330.070
	Others	18,596.729	7,337.282	7,294.629	4,968.204	38,196.844
	Total	39,218.940	16,150.578	23,963.129	19,901.462	99,234.109

Source: Tranalysis

Table 3.2.6-4 Export volume of 2,4-D technical and formulations from China by producer in 2016, tonne

No.	Producer	2,4-D amine salt 720g/L SL	2,4-D amine salt 860g/L SL	96% 2,4-D TC	98% 2,4-D TC	Total
1	Shandong Weifang Rainbow Chemical Co., Ltd.	6,225.214	4,314.060	0.000	8,439.426	18,978.700
2	Changzhou Wintafone Chemical Co., Ltd.	5,219.005	1,150.943	5,253.213	3,425.178	15,048.339
3	CAC Nantong Chemical Co., Ltd.	4,383.987	498.740	8,192.200	31.250	13,106.177
4	Jiangsu Huifeng Agrochemical Co., Ltd.	7,617.974	812.539	5.000	2,176.108	10,611.621
5	Nanjing CF Agrochemical Co., Ltd.	5,370.003	4,122.737	688.590	0.000	10,181.330
6	Weihai Hanfu Biochemical Medicine Co., Ltd.	499.104	2,034.037	1,022.000	3,581.495	7,136.636
7	Jingma Chemicals Co., Ltd.	319.258	509.239	5,516.250	0.000	6,344.747
8	Anhui Xinglong Chemical Co., Ltd.	3,377.629	39.200	0.000	177.200	3,594.029
9	Shandong Keyuan Chemical Industry Co., Ltd.	1,293.979	873.227	476.000	889.505	3,532.711
10	Shandong Qiaochang Chemical Co., Ltd.	751.309	257.242	1,754.205	0.000	2,762.756
	Others	4,161.478	1,538.614	1,055.671	1,181.300	7,937.063
	Total	39,218.940	16,150.578	23,963.129	19,901.462	99,234.109

Source: Tranalysis

4 Consumption of 2,4-D in China, 2019–2021

4.1 Consumption overview, 2019–2021

In 2019–2020, over 70% of China's 2,4-D technical (converted into 100% technical) was exported, and the rest was used to produce other 2,4-D products, mainly including 2,4-D butylate, 2,4-D amine salt, 2,4-D-ethylhexyl and 2,4-D Na. In China, 2,4-D products are utilized as herbicides in the form of esters and amine salts. The main specifications of 2,4-D formulations in domestic market include 2,4-D amine salt 720g/L SL and 2,4-D amine salt 860g/L SL.

In 2021, with no extra promotion efforts being placed, the consumption of 2,4-D in China is believed to remain basically stable; unless there is resistance to glyphosate in China in the future and 2,4-D is needed to solve the problem, the amount of 2,4-D in China will not change much.

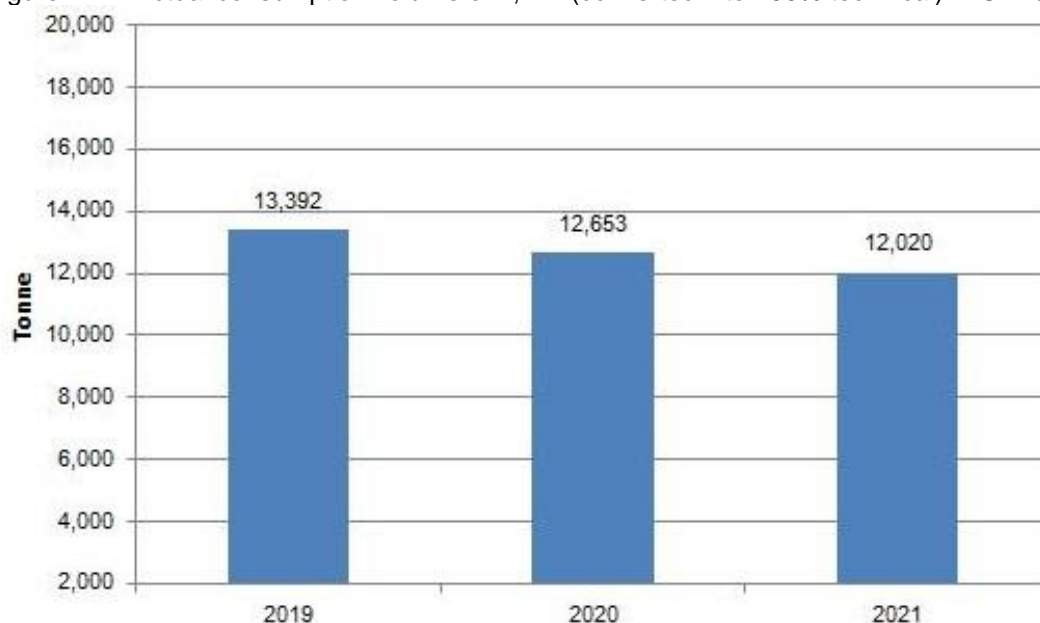
Table 4.1-1 Production, export, import and apparent consumption of 2,4-D in China, 2019–2021

Year	Capacity of 2,4-D technical, t/a	Output of 2,4-D technical, tonne (converted to 100% technical)	Import volume, tonne (converted to 100% technical)	Export volume, tonne (converted to 100% technical)	Apparent consumption volume, tonne
2019	250,700	69,830	0	58,600	11,230
2020	250,700	64,144	0	53,465	10,679
2021	250,700	58,350	0	47,930	10,420

Note: The export for 2021 is estimated.

Source: China Customs, CCM

Figure 4.1-1 Actual consumption volume of 2,4-D (converted into 100% technical) in China, 2019–2021



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

Source: CCM

4.2 Share by crop, 2021

In 2013–2016, 2,4-D formulations had witnessed a stable growth in domestic consumption, with the application volume growing on corn, forestland, rice, etc. It's worth noting that from 2017 to 2020 the domestic consumption met year-on-year declines influenced by the zero-growth policy in pesticide use.

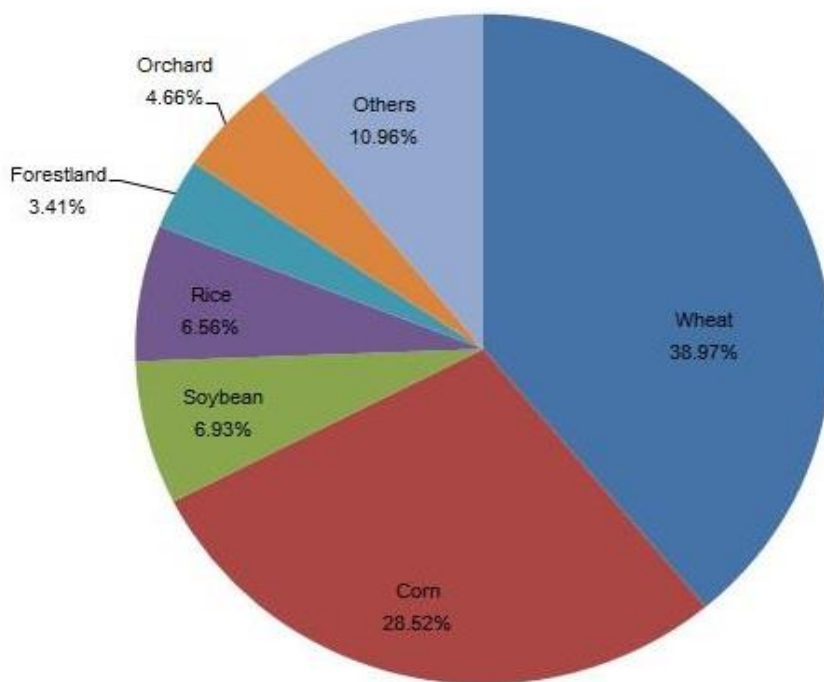
Among all the 2,4-D products, 2,4-D butylate is commonly used in wheat and corn fields. But since it could cause many problems, 2,4-D butylate is of high possibility to be gradually replaced by 2,4-D-ethylhexyl. The production cost of 2,4-D-ethylhexyl is slightly higher than that of 2,4-D butylate. Raw materials of these two

products are different but their production technologies are similar. In addition, 2,4-D-ethylhexyl has the obvious advantage that it is less volatile than 2,4-D butylate, so it does not drift very far away to damage the broad-leaved plants around. This contributes to its high competitiveness in high-temperature areas.

Regarding the weaknesses of 2,4-D butylate, like easily volatilizing in the air and requiring strict utilizing conditions, they have not only deterred researchers from further developing, but also led to the decision by the Chinese government to stop 2,4-D butylate's domestic application and sales from 2023. 2,4-D butylate can drift to 500 meters away from the original farmland and affect sensitive crops, such as tomatoes, grapes and other broad-leaved plants, which will become worse if the product is used in high-temperature and dry places. Besides, 2,4-D butylate is likely to remain in sprayers and not easy to be cleaned and disposed of. It would damage broad-leaved plants like vegetables if the sprayers are used by mistake. Furthermore, 2,4-D butylate takes effect in places where the temperature is higher than 10 °C, and the optimum temperature is regarded as 20 °C–30 °C. It would perform badly and even out of work if temperature is lower than 10 °C.

But some farmers do prefer 2,4-D butylate and almost use it in every stages of planting corn and wheat to control weeds on the ground. This product can be absorbed by object plants quickly and is not easily carried away by rain. Besides, its effect on the soil does not last for a very long time, which is beneficial to further crop planting. The characteristics above and the low market price have earned 2,4-D butylate the edge that being utilized in China for decades.

Figure 4.2-1 Consumption of 2,4-D formulations (converted into 100% technical) by crop in China, 2021E

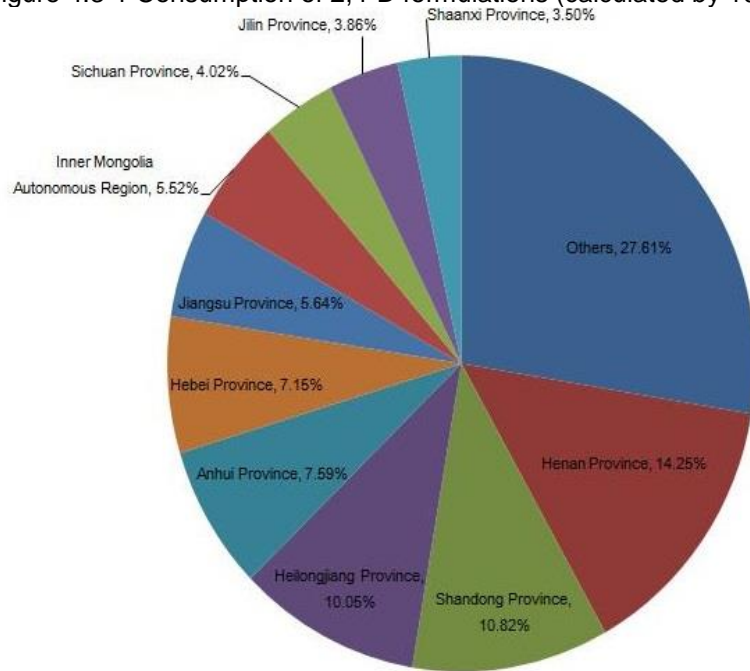


Note: Due to rounding, the total may not equal 100.00%.
Source: CCM

4.3 Share by region, 2021

Regional distribution of 2,4-D consumption is closely related to the planting structure of crops, the condition of application and the growth rate of weeds in China. As analysed, annual consumption volume of 2,4-D (mainly 2,4-D esters) in wheat, corn and soybean has maintained over 70% in 2013–2021; thus, the major wheat, corn and soybean planting regions take leading positions in the consumption of 2,4-D, such as Heilongjiang Province, Henan Province, Shandong Province, Hebei Province.

Figure 4.3-1 Consumption of 2,4-D formulations (calculated by 100% technical) in China by region, 2021E



Note: Due to rounding, the total may not equal 100.00%.

Source: CCM

5 Forecast on 2,4-D industry in China, 2022–2026

5.1 Key influencing factors

- Policy on environmental protection

In recent years, most of the unqualified 2,4-D technical enterprises have been stopped production, owing to their failure in reaching the standard of pollutant treatment. Sewage discharge of 2,4-D technical production makes an impact on the environment; therefore, the supervision over 2,4-D technical production is very strict in China, and relevant policies were rolled out, such as the *Environmental Protection Laws of the People's Republic of China* which was issued on 1st January, 2015. It is not allowed to expand the capacity of 2,4-D technical unless the manufacturers launch technological reforms.

At present, 2,4-D is a widely-used herbicide, featuring in good solubility, which will cause pollution to groundwater and surface water. The product and its metabolic products with biotoxicity, like 2,4-dichlorophenol, have been posing a tangible threat to human health and natural environment.

- Production cost

Given jumping price of its raw materials over 2021 and tough restrictions on electricity use and production imposed in China in Q3, production cost of 2,4-D technical went up in China. In the short term, it is expected that domestic supply of 2,4-D technical would stay under pressures from the 2022 Beijing Winter Olympics, "2+26" air pollution prevention and control initiative (covering Beijing Municipality, Tianjian Municipality, and 26 cities in surrounding areas), COVID-19 involvement in winter and early spring, etc. Besides, facing uncertainties around the world, escalating geopolitical tensions in East Europe, in particular, inflation, supply chain disruption, sky-high crude oil price and higher shipping cost are expected, along with some other aftermaths. There will be difficulties at all levels for China's pesticide industry to fare well in the near future.

- Demand

There is still an oversupply of 2,4-D technical now in China. Most 2,4-D products, including 96% TC, 98% TC, 2,4-D amine salt 720g/L SL and 2,4-D amine salt 860g/L SL, are for export. 2,4-D butylate EC is mainly consumed in the domestic market. In 2020 and 2021, domestic demand remained stable.

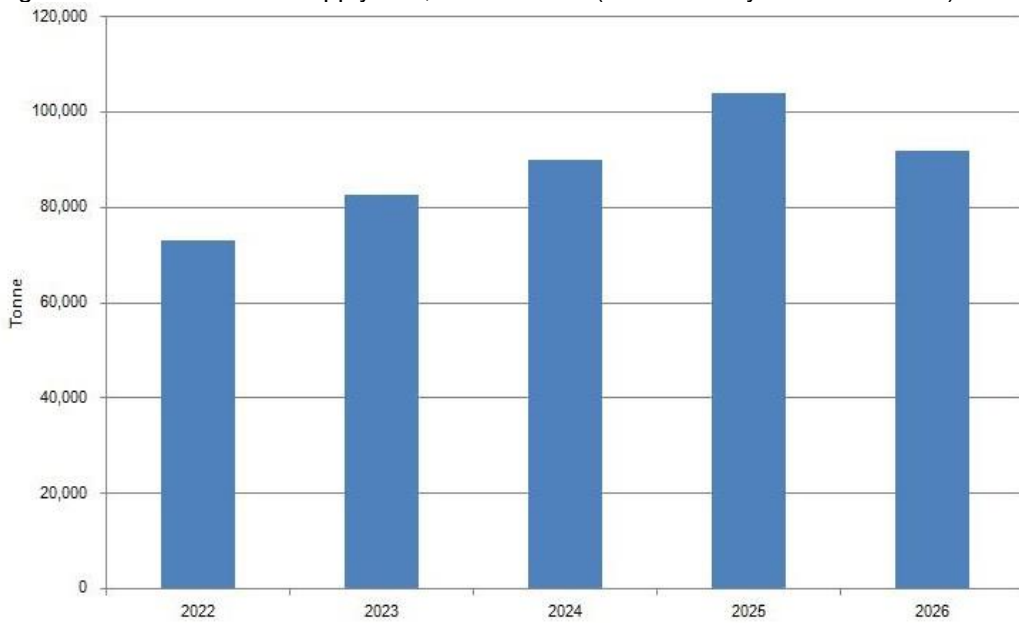
Overseas market provides an important outlet for the consumption of China's superfluous output. In early 2022, overseas demand is expected to recover for the following reasons:

- Rising grain prices greatly boosting farmers' enthusiasm in grain cultivation.
- The urgent needs of distributors for replenishing inventory.
- The upcoming sales season in South America and the farming season in north hemisphere in the spring.

5.2 Forecast on supply and demand

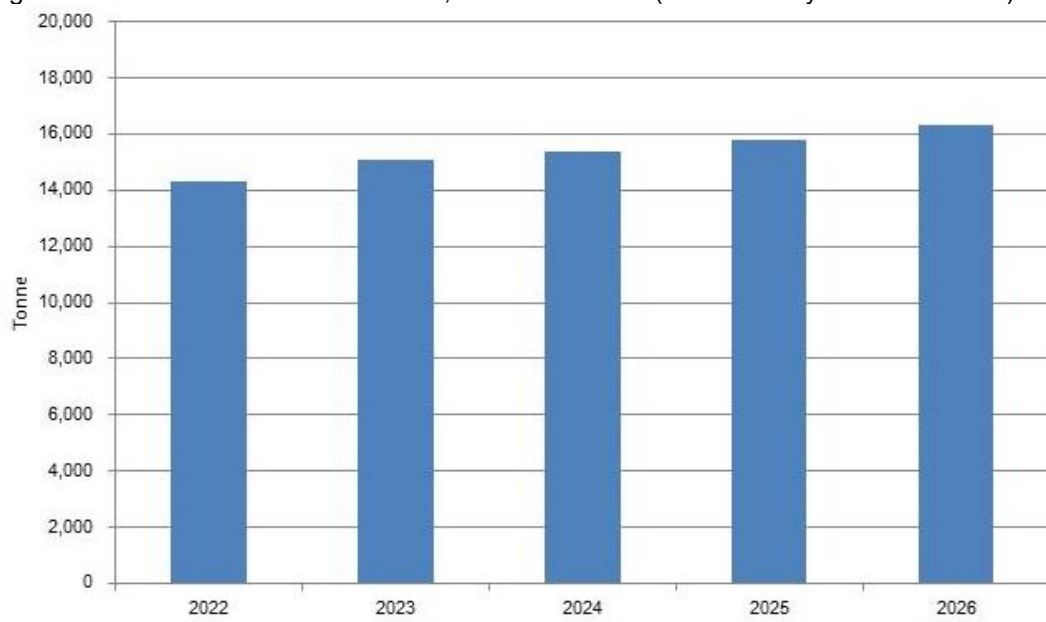
Despite 2,4-D butylate to be withdrawn from Chinese market after Jan. 2023, demand for 2,4-D is stable from home and abroad. After Jan. 2023, the domestic demand for 2,4-D butylate would be completely replaced by other products, such as 2,4-D-ethylhexyl. Therefore, 2,4-D still enjoys a promising prospect in China.

Figure 5.2-1 Forecast on supply of 2,4-D technical (calculated by 100% technical) in China, 2022–2026



Source: CCM

Figure 5.2-2 Forecast on demand for 2,4-D formulations (calculated by 100% technical) in China, 2022–2026



Source: CCM

6 Conclusion

Electricity is essential for manufacturing industry. In Q4 2021, short-term power shortage became serious in China, especially in Jiangsu Province and Zhejiang Province. Indeed, efficient production will play an ever more important role for 2,4-D industry, rather than adding new capacity. Otherwise, production suspension will happen more frequently, under louder call for control over energy consumption intensity with more measures to preempt energy shortfall expected.

In addition, soaring price of raw materials was seen in 2021. China's 2,4-D output was recorded a year-on-year decline. The overall market seemed not going well, but we should not ignore that China still maintained a quite stable supply of 2,4-D technical for markets home and abroad basically.

In order to meet with stricter environmental protection requirements, China's 2,4-D enterprises have been moving towards energy-saving production process since July 2018. By gaining advantages in environmental protection, well-qualified producers have better survived from fierce competition, and put more efforts on product quality improvement. For example, in Feb. 2021, Jiangxi Tianyu Chemical Co., Ltd., a subsidiary of CAC Nantong Chemical Co., Ltd., took part in the revision of *FAO Specifications and Evaluations for Agricultural Pesticides 2,4-D*.

In China, with the popularization of minimum- and non-tillage techniques, it is expected that the chemical weeding would gain more traction with farmers. Therefore, more 2,4-D products will be needed in wheat-, corn-, and rice-growing areas. In addition, weed's gradual resistance to 2,4-D's competitors, such as glyphosate, also provides 2,4-D products with a broader space for development.

What's more, in spite of severe overcapacity and stricter environmental protection policies, there is still development space for the 2,4-D producers in China, which will generate some commercial opportunities that are mostly related to technological innovation and environmental protection in the next few years, including:

- Technological development of pollutant treatment
- R&D and promotion of environmental-friendly formulations
- Domestic and overseas market exploration
- Increasing planting area of GM crops

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