

Production Situation of Glufosinate-ammonium in China 2021

The Seventh Edition

August 2021

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Kcomber Inc.

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1. Introduction

In 2021, export volume of technical witnessed a remarkable growth. But only 11 TC producers were active, as some industrial parks in Jiangsu Province were closed due to pollution concerns, causing some producers to stop production and upgrade their equipment and techniques to satisfy the environmental standards. It seems that glufosinate-ammonium market has turned into tight supply in China over the past two years. As the market demand increases, there will be newcomers in glufosinate-ammonium TC production in future, but it is still hard to change the situation where top producers dominate the glufosinate-ammonium market.

Lier Chemical, Yongnong BioSciences, Hebei Veyong and Fuhua Tongda have new capacities of glufosinate-ammonium TC in these two years. Then what will be the development trend of the relationship between glufosinate-ammonium market's supply and demand in China in the future? And how will the market price of glufosinate-ammonium products in China change in the future?

In this report, you will find answers to the questions mentioned above. And the report mainly focuses on the information below.- Production and producers of both glufosinate-ammonium technical and formulations in China, 2017–2021

- Production technology of glufosinate-ammonium technical
- Export of glufosinate-ammonium technical and formulations in China (including volume, destination and price), 2017–2021
- Consumption of glufosinate-ammonium in China, 2017–2021

2. Approach for this report

The report is formulated by methods as follows:

X. Desk research

The sources of desk research are various, including published magazines, journals, government statistics, industrial statistics, customs statistics, 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 production information.

X. Telephone interview

CCM has carried out extensive telephone interviews in order to survey the actual production and producers' situation of glufosinate-ammonium in China.

Interviewees include:

- Key producers
- Key traders
- Associations
- Experts

Data processing and presentation

The data collected and compiled are sourced from:

- CCM's database, ValoTracer
- 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
- 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

RMB: currency unit in China, also called Yuan

USD: currency unit in the United States

Tonne: ton, equaling to metric ton in this report

t/a: tonne/annual or tonne/year

/t: per tonne

ha: hectare

Glossary

TC: Technical material

TK: Technical concentrate

AS: Aqueous solution

SL: Soluble concentrate

MDP: Methylphosphonous dichloride

Source: The People's Bank of China

3. Executive summary

Glufosinate-ammonium is a non-selective herbicide and its quick effectiveness falls between paraquat's and glyphosate's. It is commonly used in orchards, vineyards, potato fields, and non-crop land for control of annual and perennial dicotyledonous weeds and gramineous weeds in China.

Since the outbreak of COVID-XX pandemic, the ex-works price of Chinese glufosinate-ammonium has kept increasing. According to CCM price monitoring data, the ex-works price of XX% TC stood high in Nov. XXXX at USDXX,XXX/t, up by XXX.X% compared with that in Nov. XXXX, driven by tight supply and rising costs of raw materials. In HX XXXX, the overseas demand for China's glufosinate-ammonium grew, but the inventory was insufficient, which worsened due to limited production capacity of manufacturers and abnormal production of its raw material diethyl phosphite.

Regarding production, from XXXX to XXXX, the capacity of glufosinate-ammonium TC in China showed a fast growth from XX,XXX t/a to XX,XXX t/a, with a CAGR of XX.X%. And the output rose from X,XXX tonnes to XX,XXX tonnes in XXXX–XXXX, at a CAGR of XX.X%, mainly driven by soaring demand at home and abroad and technology improvement. As of June XXXX, there were XX active registrations of glufosinate-ammonium TC and XX active registrations of glufosinate-ammonium TK in China, only part of which have production lines approved and operated.

In consumption of glufosinate-ammonium, overseas consumption currently plays an important part in China's glufosinate-ammonium. The export volume of glufosinate-ammonium (converted to XXX% AI) in China saw continuous growths for years. However, a drop appeared as China and the world suffered from the outbreak of COVID-XX pandemic in early XXXX. Due to China's effective measures against the epidemic and the robust overseas demand, the XXXX export volume recovered, surging from X,XXX tonnes in XXXX to X,XXX tonnes, up XX.X% YoY. On the other hand, its high price made the domestic consumption in China not much compared with export. In XXXX–XXXX, consumption of glufosinate-ammonium in China increased from X,XXX tonnes to X,XXX tonnes, with a CAGR of XX.X%.

4. What is in the report?

Note: Key data/information in this sample page is hidden, while in the report it is not.

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1.1 Production of glufosinate-ammonium technical in China, 2017–2021

Figure 1.1-1 Capacity and output of glufosinate-ammonium technical in China, 2017–2021



Note: Output here refers to the total amount of 95% TC and three specifications (96% TC, 98% TC and 50% TK) converted to 95% TC.

Source:CCM

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1.2 Production of glufosinate-ammonium formulations in China, 2017–2021

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From XXXX to XXXX, China's output of glufosinate-ammonium formulations increased significantly from XX,XXX tonnes to XX,XXX tonnes, which was mainly boosted by the rocketing demand from both domestic and overseas markets, decreasing production cost and better product quality following technological improvements.

...

2.1 Producers of glufosinate-ammonium technical in China, 2017–2021

Table 2.1-1 Capacity and output of glufosinate-ammonium technical producers in China, 2017–2021

No.	Producer	Capacity, t/a					Output, tonne				
		2017	2018	2019	2020	2021	2017	2018	2019	2020	2021
X	XXXX XXXXXXXX	XXXXX	XXXXX	XXXXX	XXXXXX	XXXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXXX
X	XXXXXXXXXX XXXXXXXXXX XX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX
X	XXXXX XXXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXX	XXXXX	XXXXX	XXXXX	XXXXX
X	XXXXXXXXXX XXX XXXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXX	XXX	XXX	XXX	XXX
X	XXXXX XXXXXX	X	XXXX	XXXXX	XXXXX	XXXXX	X	XXX	XXX	XXX	XXX
X	XXXXXXXXXX XXXXXX	X	X	XXXXX	XXXXX	XXXXX	X	X	XXX	XXX	XXX
X	XXXXXXXXXX XXX XXX	X	X	XXXXX	XXXXX	XXXXX	X	X	XXX	XXX	XXX
X	XXXXX XXXXXXXXXX XXXXXXXXXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
X	XXXXXXXXXX XXXXXXXXXX XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXX	X	X	X	XXX
XX	XXXX XXXXXXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXX	XXX	XXX	XXX	XXX
XX	XXXXXXXXXX XXXXXXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXX	X	X	X	XXX
XX	XXXXXXXXXX XXXXXXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXX	XXX	X	X	X
XX	XXXXXXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	X	XXX	X	X	X

	XXXXXXX											
XX	XXXXXXX XXXXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	X	X	X	X	X	X
XX	XXXXXXXXX XXXXXXXXX	XXX	XXX	XXX	XXX	XXX	X	X	X	X	X	X
XX	XXXXXXXXX XXXXXXX	XXX	XXX	XXX	XXX	XXX	XX	X	X	X	X	X
	XXXXX	XXXXX X										

Source:CCM

As of June XXXX, there were XX active registrations of glufosinate-ammonium TC and XX active registrations of glufosinate-ammonium TK in China, only part of which have production lines approved and operated.

In XXXX, only XX TC producers were active, as some industrial parks in Jiangsu Province were closed due to pollution concerns, causing some producers to stop production and upgrade their equipment and techniques to satisfy the environmental standards. Small producers found it difficult to survive the fierce competition. As the market demand increases, there will be newcomers in glufosinate-ammonium TC production in future, but it is still hard to change the situation where top producers dominate the glufosinate-ammonium market.

Long-term leading players

Lier Chemical, Yongnong BioSciences, Hebei Veyong and Fuhua Tongda have been the top suppliers in terms of capacity or output in China.

- Lier Chemical: With XX,XXX t/a capacity newly added in XXXX, Lier Chemical's capacity reached XX,XXX t/a, boasting the world's largest glufosinate-ammonium production capacity; the X,XXX t/a glufosinate-P TC (Phase I) production line started construction in Jan. XXXX and went into production in Jan. XXXX.
- Yongnong BioSciences: In the past few years, its capacity expansion fell far behind Lier Chemical. While in May XXXX, after the overall upgrading and transformation of all glufosinate-ammonium TC production lines, its capacity was expanded to X,XXX t/a; its subsidiary in Ningxia Hui Autonomous Region proposed a XX,XXX t/a glufosinate-ammonium TC plan in June XXXX. The company also proposed a X,XXX t/a glufosinate-P TC project in Oct. XXXX, and it was completed and put into production in April XXXX.
- Hebei Veyong: It completed the X,XXX t/a glufosinate-ammonium TC project in Nov. XXXX. And its

capacity is X,XXX t/a now.

- Fuhua Tongda: It completed its first production line of X,XXX t/a glufosinate-ammonium TC in Sept. XXXX, making it an up-and-coming powerhouse in the industry; its another X,XXX t/a glufosinate-ammonium TC project is in progress.

Newcomers

- Shandong Eshung: As a new entrant with the X,XXX t/a glufosinate-ammonium TC production line completed in Jan. XXXX, the company released the environmental impact assessment (EIA) report of the pesticide project including XX,XXX t/a glufosinate-ammonium TC and XX,XXX t/a glufosinate-P technical in Oct. XXXX.
- Nanjing Red Sun: Its X,XXX t/a glufosinate-ammonium TC facilities were completed in Dec. XXXX; another XX,XXX t/a glufosinate-ammonium TC project is undergoing by its subsidiary Chongqing Huage Biochemistry Co., Ltd.

Others

- Jiangsu Sevencontinent: Its subsidiary Sevencontinent Green Chemical (Jining) Co., Ltd. in Jining City, Shandong Province released EIA report of the fine chemical project (XX,XXX t/a glufosinate-P TC included) in Dec. XXXX and held a groundbreaking ceremony in July XXXX.
- Shijiazhuang Richem: The company expanded its glufosinate-ammonium TC capacity to X,XXX t/a in XXXX from XXX t/a, further increasing to X,XXX t/a in XXXX.
- Shandong Weitian, Inner Mongolia Jiaruimi and Shandong Binnong: These three companies have owned production lines for years but produced in a very small quantity or had no operation in recent years. Among them, Shandong Binnong's wholly-owned subsidiary Gansu Binnong Technology Co., Ltd. had its XX,XXX t/a pesticide intermediate project (including XX,XXX t/a glufosinate-ammonium TC) put into production at one time in Sept. XXXX, while the project is still in the production debugging stage at present.

2.2 Producers of glufosinate-ammonium formulations in China, 2017–2021

Table 2.2-1 Output of glufosinate-ammonium formulations producers in China, 2017–2021

No.	Producer	Output, tonne				
		2017	2018	2019	2020	2021
X	XXXXXXXXXXXXXXXXXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXXX
X	XXXXXXXXXXXXXXXXXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX
X	XXXX XXXXXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX
X	XXXXX XXXXXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX
X	XXXXXXXXXXXXXXXXXXXX	XXXXX	XXX	XXXXX	XXXXX	XXXXX
X	XXXXXXXXXXXXXXXXXXXX	XXX	XXX	XXX	XXX	XXX
	XXXXXX	XXX	XXXXX	XXXXX	XXXXX	XXXXX
	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX

Note: Output here refers to the total amount of glufosinate-ammonium formulations including 100g/L AS, 180g/L AS, 200g/L AS and 280g/L SL.

Source: CCM

The registrations of glufosinate-ammonium formulations in China went up sharply. As of June XXXX, there have been XXX companies in China completing XXX active registrations, XXX of which are for the key specification, XXX g/L AS. Despite a large number of registrations, there are only X key glufosinate-ammonium formulation producers in China that have ability to produce glufosinate-ammonium formulations over XXX tonnes per year.

In XXXX–XXXX, Lier Chemical, Jiangsu Sevencontinent and Yongnong BioSciences saw large increases in the output of formulations. Jiangsu Sevencontinent, in particular, has become one of key producers of glufosinate-ammonium formulation in China, along with its vigorous promotion in the domestic market. However, in XXXX, Jiangsu Huifeng suspended production for pollution issues from May but then resumed in Nov.

3 Production technology

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The production technology of glufosinate-ammonium TC has been improving, and the ultimate yield is XX%–XX% in China. Explosions have also been rare during production in recent years, because of

Chinese producers' accumulated production experience and their efforts in technology improvement.

Chinese producers have made progress in their technology levels, having optimised the reaction conditions and parameters, reduced discharge of pollutants, lowered the unit consumption of raw materials and increased product yield, etc. For example, Lier Chemical developed a new method to compound methyldiethoxyphosphine, by taking natural gas and phosphorus trichloride to produce methyl dichlorophosphite, which then reacts with ethanol and ammonium to make the desired substance.

Lier Chemical is the only Chinese producer that masters the Hoechst route. Its glufosinate-ammonium TC capacity was improved to X,XXX t/a in XXXX (still uses the Strecker route). It claimed in Feb. XXXX that its subsidiary Guang'an Lier Chemical Co., Ltd. would start a XX,XXX t/a methylphosphonous dichloride (MDP) project, and announced at the end of Dec. XXXX that Guang'an Lier would suspend production for upgrading (consolidation of MDP and glufosinate-ammonium technical production lines) for at least three months. In XXXX, Guang'an Lier continued to improve the MDP project.

4 Export

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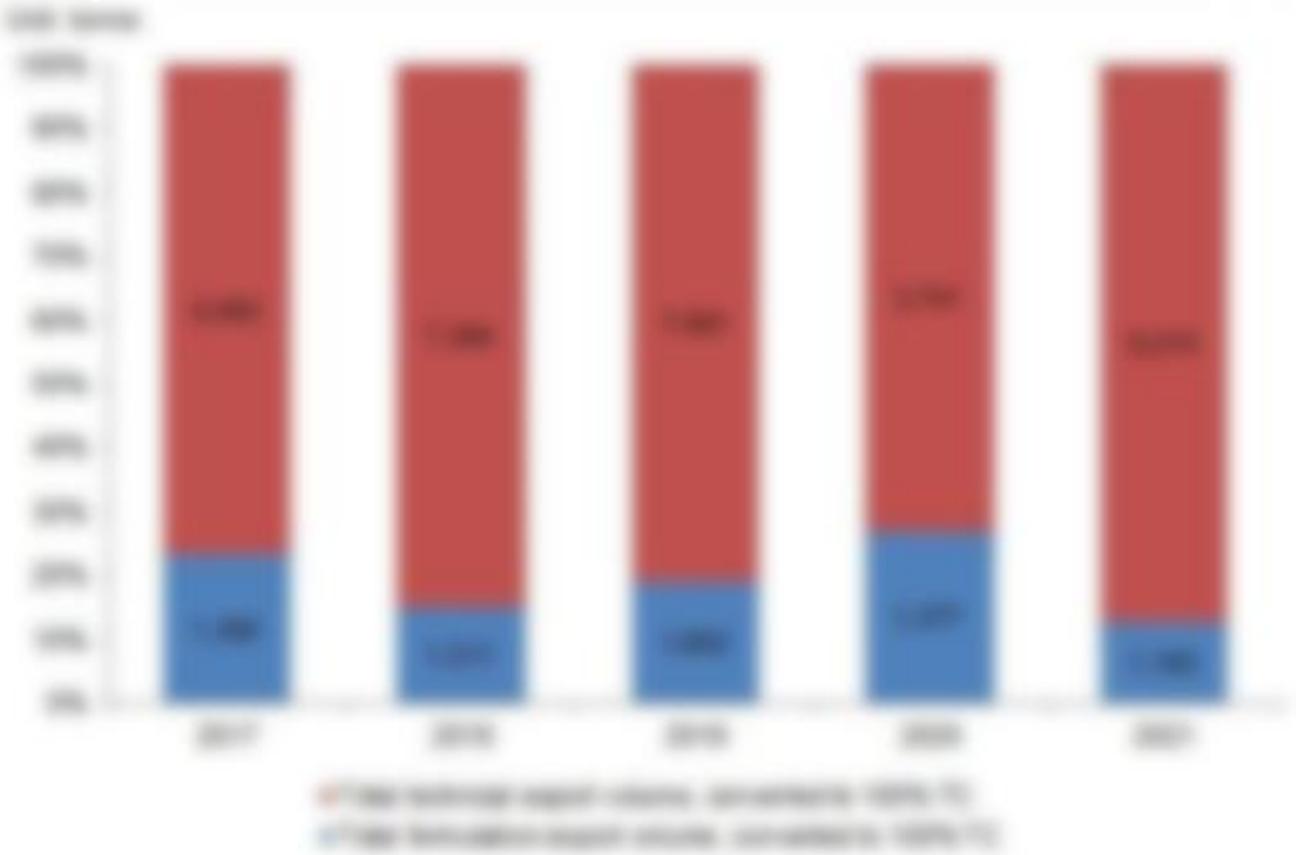
The export volume of glufosinate-ammonium (converted to XXX% AI) in China saw continuous growths for years. However, a drop appeared as China and the world suffered from the outbreak of COVID-XX epidemic in early XXXX. Due to China's effective measures against the epidemic and the robust overseas demand, the XXXX export volume recovered, surging from X,XXX tonnes in XXXX to X,XXX tonnes, up XX.X% YoY.

Although glyphosate and paraquat remain the top two popular herbicides used widely in the global market, growing resistance to them, rising concerns over the carcinogenicity of glyphosate and the expanding bans on paraquat in more countries all give glufosinate-ammonium great opportunities to take up more market shares. The growing resistance of some weeds to glyphosate has led to the development of other herbicide-resistant transgenic crops. In recent years, the seeds of glufosinate-ammonium resistant transgenic crops have been approved worldwide. At present, glufosinate-ammonium resistant genes have been introduced into more than XX crops such as rape, corn, cotton, wheat, and sugarcane.

In addition, Thailand cancelled the use of paraquat since X Dec., XXXX; Brazil banned paraquat from Sept. XXXX. The California state in the US also plans to ban paraquat and glyphosate in the future against their poison effects. Once paraquat gets banned, its market will be replaced by the remaining herbicides, and glufosinate-ammonium is regarded as one of the best substitutes. Therefore, overseas demand for

glufosinate-ammonium will further increase.

Figure 4-1 China's export volume of glufosinate-ammonium technical and formulation, 2017–2021



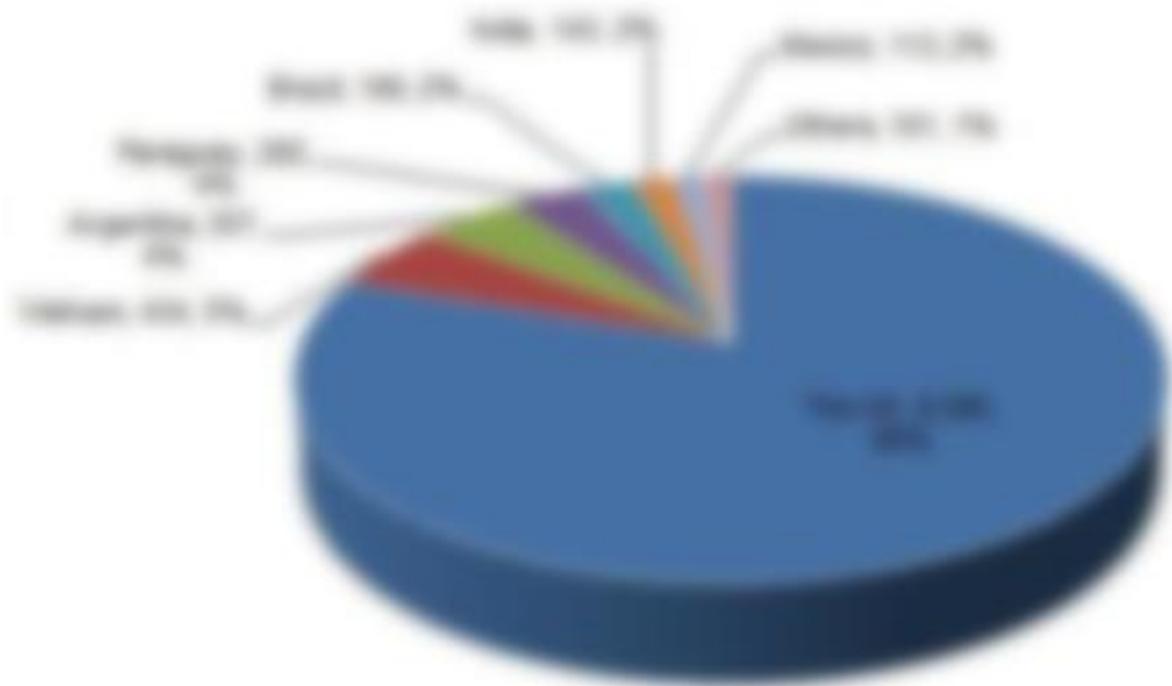
Note:1. After April 2020, data of exports are incomplete mainly caused by the changed sources.
 2. All the volumes are calculated by 100% technical.
 Source:Tranalysis

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4.1 Export of glufosinate-ammonium technical in China, 2017–2021

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Figure 4.1-1 Export destinations of China's glufosinate-ammonium technical by volume and share, 2021, tonne



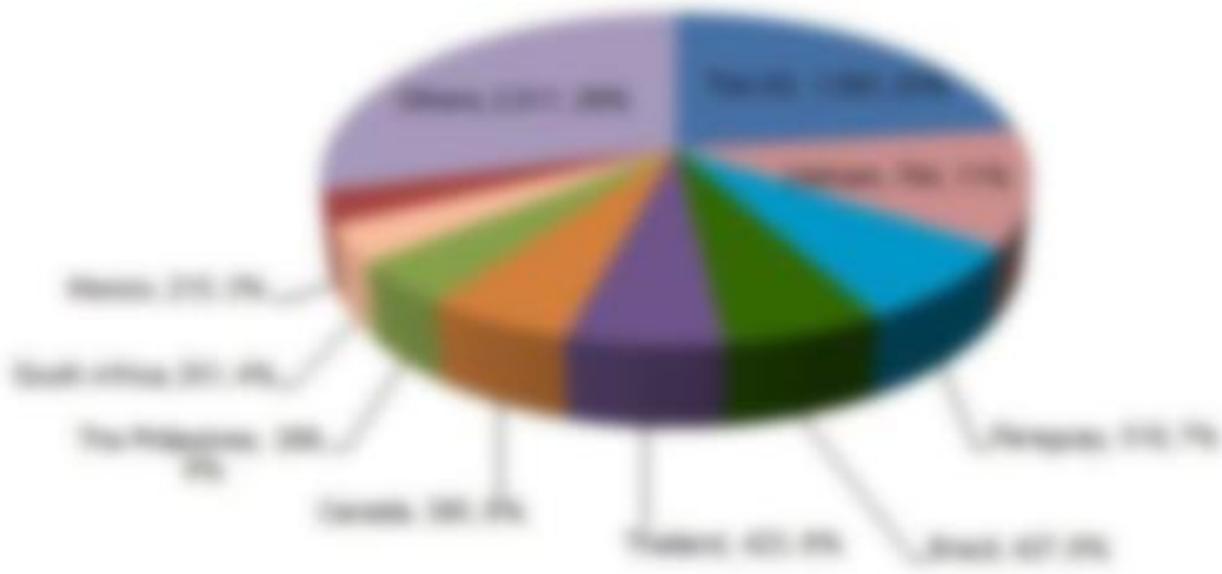
Note:1. There are four specifications of glufosinate-ammonium technical produced in China, i.e. 95% TC, 96% TC, 98% TC and 50% TK.
 2. All the volumes are calculated by 100% technical.
 Source:Tranalysis

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4.2 Export of glufosinate-ammonium formulations in China, 2017–2021

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Figure 4.2-1 Export destinations of China's glufosinate-ammonium formulations by volume and share, 2017–2021, tonne

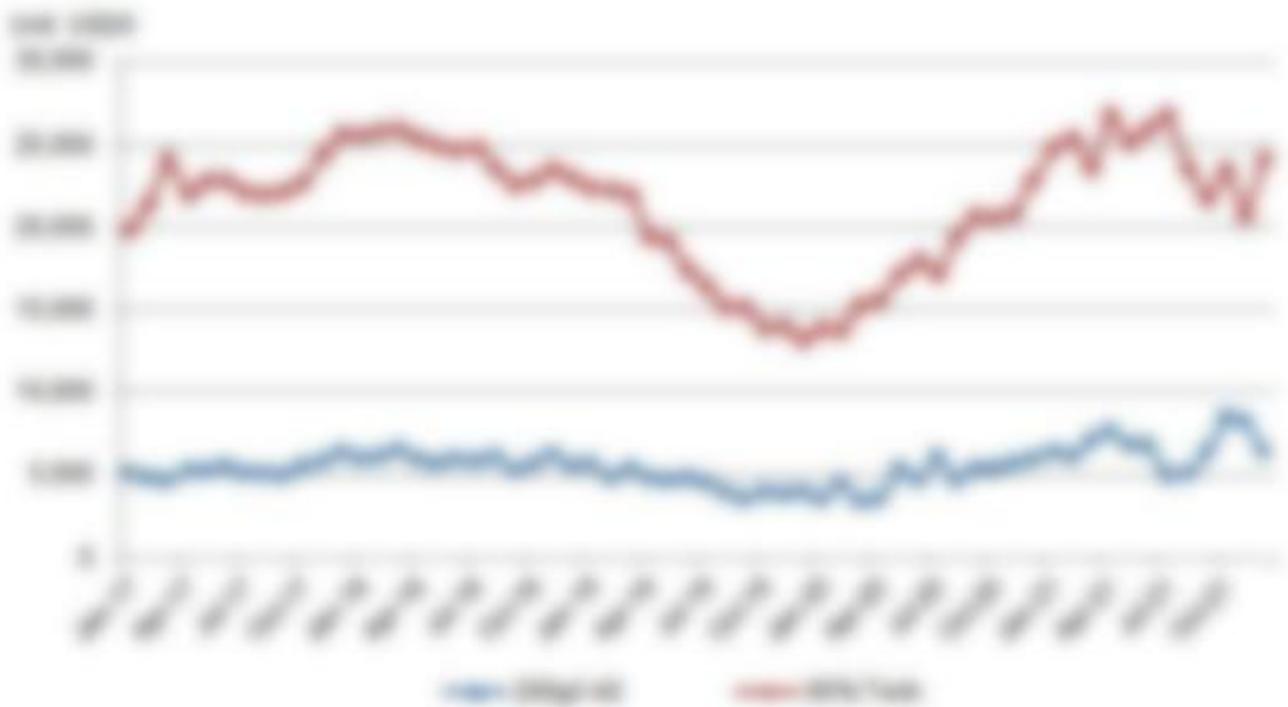


Note:1. Export volume here refers to the total amount of four formulations, including 150g/L AS, 180g/L AS, 200g/L AS and 280g/L SL.
 2. All the volumes are calculated by 100% technical.
 Source:Tranalysis

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5 Price

Figure 5-1 Monthly export prices of 95% glufosinate-ammonium technical and glufosinate-ammonium 200g/L AS in China, Jan. 2017–Dec. 2021



Note:1. The price in total is weighted average price.

2. These data are obtained by CCM's analysis on 8 digit HS code of China Customs data. The Customs data consist of many shipments, and the prices can be FOB prices, C&F prices or CIF prices. However, it is very hard to distinguish which shipment is FOB price, C&F price or CIF price as there is no precise explanation in 8 digit HS code Customs data. So the prices in above figure are weighted average prices of FOB prices, CIF prices and C&F prices, and the relevant weight is the export volume of each shipment. Here is the calculation formula: $\text{Weighted average prices} = (\text{export volume}_1 \times \text{price}_1 + \text{export volume}_2 \times \text{price}_2 + \dots + \text{export volume}_n \times \text{price}_n) / (\text{export volume}_1 + \text{export volume}_2 + \dots + \text{export volume}_n)$.

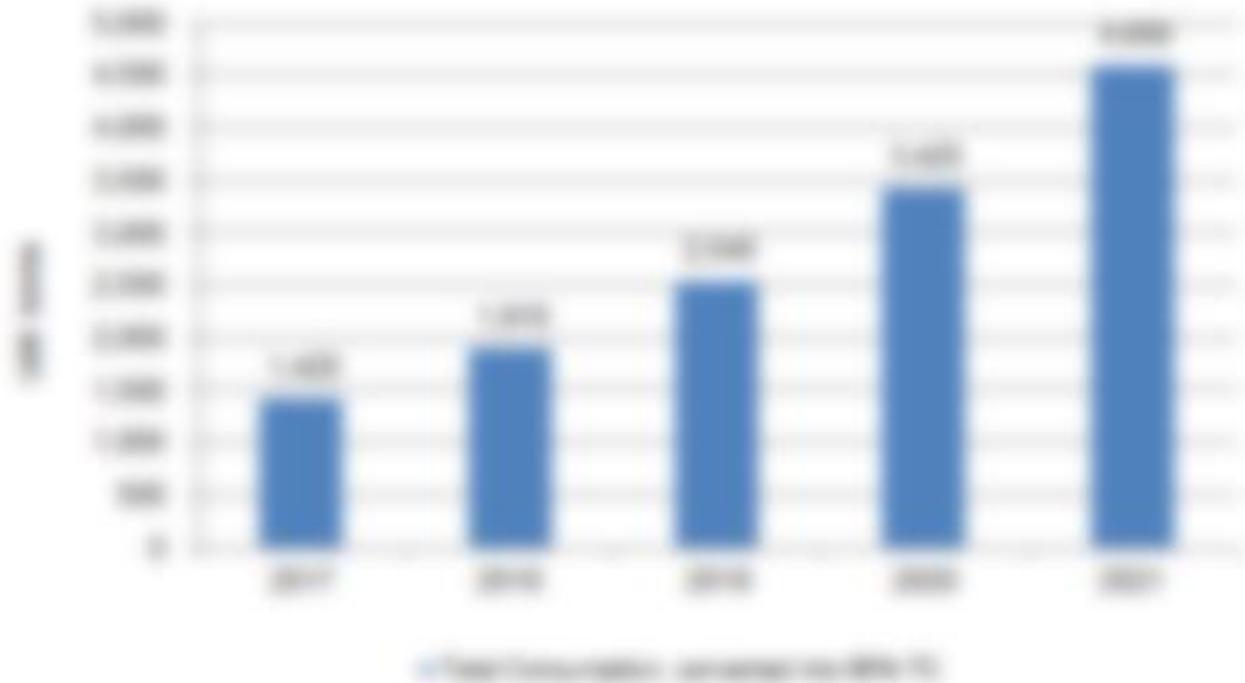
3. 95% TC is the dominant specification of glufosinate-ammonium technical produced and exported in China, while 200g/L AS is the dominant specification of Chinese glufosinate-ammonium formulations.

Source:China Customs & Tranalysis

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6 Domestic consumption

Figure 6-1 Consumption of glufosinate-ammonium in China, 2017–2021, tonne



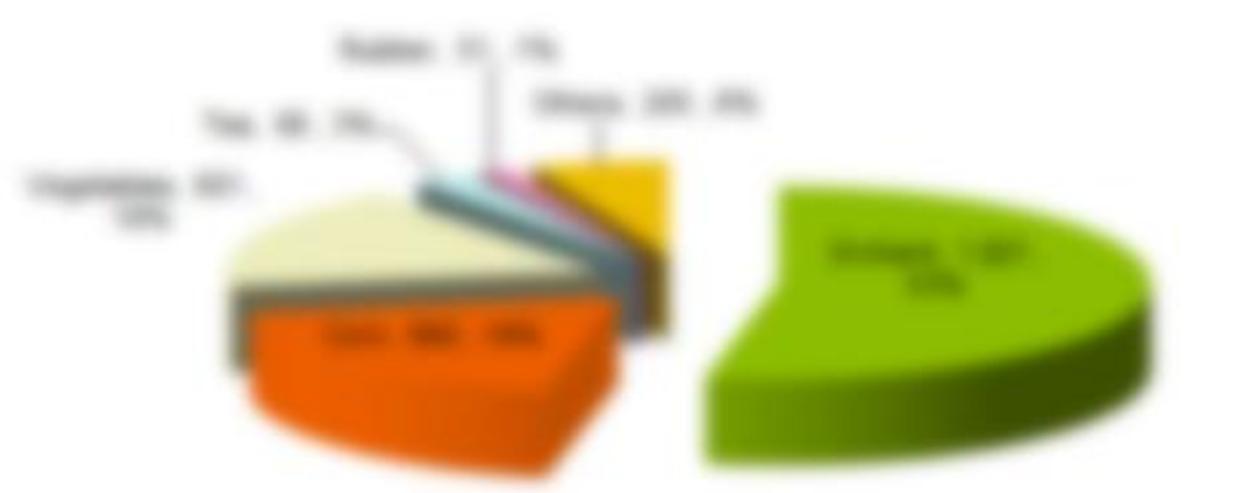
Note:1. The consumption in this figure is all the specifications' consumption converted to 95% TC, including both technical and formulations of glufosinate-ammonium.

2. The consumption of the specification converted in 95% TC = the actual consumption of the specification * its content rate of active ingredient of glufosinate-ammonium / 0.95.

3. The resulting consumption is rounded up.

Source:CCM

Figure 6-2 Consumption pattern of China's glufosinate-ammonium by main target crops, 2020, tonne



Note:1. The consumption in this figure is all the specifications' consumption converted to 95% TC, including both technical and formulations of glufosinate-ammonium.

2. The consumption of the specification converted in 95% TC = the actual consumption of the specification * its content rate of active ingredient of glufosinate-ammonium / 0.95

Source:CCM

...

Table 6-1 Planting areas of glufosinate-ammonium's main target crops in China, 2017–2020, '000 ha

Crop	2017	2018	2019	2020
XXXXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
XXXXXXXXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
XXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
XXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
XXX	XXXXX	XXXXX	XXXXX	XXXXX
XXXXXX	XXXXX	XXXXX	XXXXX	XXXXX
XXXXXX	XXXXX	XXXXX	XXXXX	XXXXX
XXXXXXXXXXXX	XXXXX	XXXXX	XXXXX	XXXXX
XXXXX XXXXXXXX XXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX

Source:National Bureau of Statistics of China & CCM

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