

# Production Situation of Glufosinate-ammonium in China 2022

The Eighth Edition

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**Researched & Prepared by:**

**Kcomber Inc.**

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## 1. Introduction

In 2018–2022, China's glufosinate-ammonium production has been in a fast expansion period, with significant growth in capacity and output. However, the export volume saw fluctuations during this period, with growth slowing down in 2019 and even a large drop in 2020. In 2022, export volume of technical witnessed a remarkable growth.

Hebei Veyong and Ningxia Wynca have new capacities of glufosinate-ammoniumTC in 2022. 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, 2018-2022.
- Production technology of glufosinate-ammonium technical
- Export of glufosinate-ammonium technical and formulations in China (including volume, destination and price), 2018-2022.
- Consumption of glufosinate-ammonium in China, 2018-2022.

## 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

SG: Water soluble granule

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 the 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. Thanks to completion and operation of new capacities in China, the ex-works price started to go down in Dec. XXXX and dipped to USDXX,XXX/t in April XXXX, down XX.X% from the peak in Nov. XXXX. However, the price recovered as a result of the sustained increase in the price of yellow phosphorus from April to June. From July until Dec., with the pesticide market gradually entering off-season and the continued release of production capacity, the ex-works price of glufosinate-ammonium continued to fall to USDXX,XXX/t.

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 XX,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 Dec. 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 growth for years. However, a drop appeared as China and the world suffered from COVID-XX in early XXXX. Due to China's effective measures against the epidemic and the robust overseas demand, the XXXX export volume recovered 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, as the impact of the COVID-XX epidemic diminished, glufosinate-ammonium producers gradually recovered their production capacity and global demand for glufosinate-ammonium continued to grow, with exports surging to XX,XXX tonnes, up XXX.X% YoY. 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?

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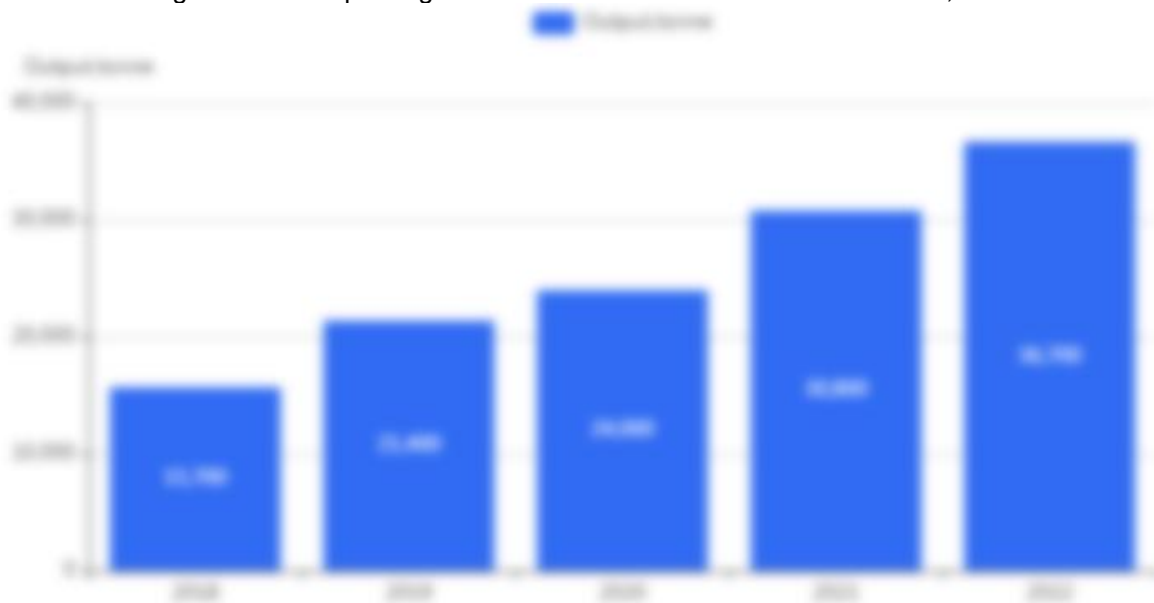
## 1 Production

Glufosinate-ammonium technicals produced in China include XX% technical (TC), XX% TC, XX% TC and XX% technical concentrate (TK), of which XX% TC is the main specification. And glufosinate-ammonium formulations include XXXg/L AS, XXXg/L AS, XXXg/L AS, XXXg/L AS, XX% AS, XXXg/L SL, XXXg/L SL, XXXg/L SL, XXXg/L SL, XX% SG and XX% SG, with XXXg/L AS as the dominant formulation.

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### 1.2 Production of glufosinate-ammonium formulations in China, 2018–2022

Figure 1.2-1 Output of glufosinate-ammonium formulations in China, 2018–2022



*Note:1. Output here refers to the total amount of glufosinate-ammonium formulations including 100g/L AS, 150g/L AS, 180g/L AS, 200g/L AS, 50%AS, 150g/L SL, 180g/L SL, 200g/L SL, 280g/L SL, 80% SG and 88% SG.*

*2. The output data of Bayer CropScience (China) Co., Ltd., which did not disclose its glufosinate-ammonium formulation output, is excluded.*

*Source:CCM*

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.



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## 2.1 Producers of glufosinate-ammonium technical in China, 2018–2022

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As of Dec. 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. On XX October XXXX, Hebei Veyong announced that the company completed the construction and equipment installation of the X,XXX t/a glufosinate-ammonium project. It has passed the expert review for trial production plan and entered the commissioning stage. 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. On X July XXXX, it signed a new XX,XXX t/a glufosinate-ammonium and related ancillary projects.

### 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.
- Ningxia Wynca: In June XXXX, it completed its first production line of X,XXX t/a glufosinate-ammonium TC; its another X,XXX t/a glufosinate-ammonium TC project is in progress.

#### Others

- Jiangsu Sevencontinent: Its subsidiary Sevencontinent Green Chemical (Jining) Co., Ltd. in Jining City, Shandong Province released the 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. In August XXXX, the People's Court of Zhao County, Hebei Province, issued a first instance judgment in a lawsuit between Jiangsu Huifeng and Shijiazhuang Richem: the X,XXX t/a glufosinate-ammonium project was confirmed as owned by the latter. However, in response to the deliberation Jiangsu Huifeng said that an appeal would be filed.
- Shandong Binnong: Its wholly-owned subsidiary Gansu Binnong Technology Co., Ltd. had the XX,XXX t/a pesticide intermediate project (XX,XXX t/a glufosinate-ammonium TC included) put into production in Sept. XXXX. However, the company's trial production has not gone too well and it was still in the production debugging stage until June this year.
- Shandong Weitian, Inner Mongolia Jiaruimi and Rosi Chemical: These three companies have owned production lines for years but produced in a very small quantity or had no operation in recent years.

## 2.2 Producers of glufosinate-ammonium formulations in China, 2018–2022

Table 2.2-1 Output of glufosinate-ammonium formulations producers in China, 2018–2022

No.	Producer	Output, tonne				
		2018	2019	2020	2021	2022
X	XXXXXXXXXXXXXXXXXXXX	XXXXX	XXXXX	XXXXX	XXXXXX	XXXXXX
X	XXXXXXXXXXXXXXXXXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXX
X	XXXX XXXXXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXX
X	XXXXX XXXXXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXX
X	XXXXXXXX XXXXXXXX	XXX	XXXXX	XXXXX	XXXXX	XXXX
X	XXXXXXXX XXXXXXXX	XXX	XXX	XXX	XXX	XXX
	XXXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXX
	XXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXX

Note:1. Output here refers to the total amount of glufosinate-ammonium formulations including 100g/L AS, 150g/L AS, 180g/L AS, 200g/L AS, 50%AS, 150g/L SL, 180g/L SL, 200g/L SL, 280g/L SL, 80% SG and 88% SG.

2. The output data of Bayer CropScience (China) Co., Ltd., which did not disclose its glufosinate-ammonium formulation output, is excluded.

Source:CCM

The registrations of glufosinate-ammonium formulations in China went up sharply. As of Dec. 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 the 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 methyl diethoxyphosphine, 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. In March XXXX, the company revealed that it will put the MDP project into full production this year.

## 4 Export

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The export volume of glufosinate-ammonium (converted to XXX% AI) in China saw continuous growth for years. However, a drop appeared as China and the world suffered from the outbreak of the 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. In XXXX, as the impact of epidemic waned, global demand for glufosinate-ammonium continued to gain momentum and glufosinate-ammonium producers gradually recovered and increased their production, with exports surging to XX,XXX tonnes, up XXX.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, in XXXX paraquat has been banned in Thailand from June and in Brazil from Sept. California state in the US also plans to ban paraquat and glyphosate in the future against their poisoning effects. Once banned, paraquat on the 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.

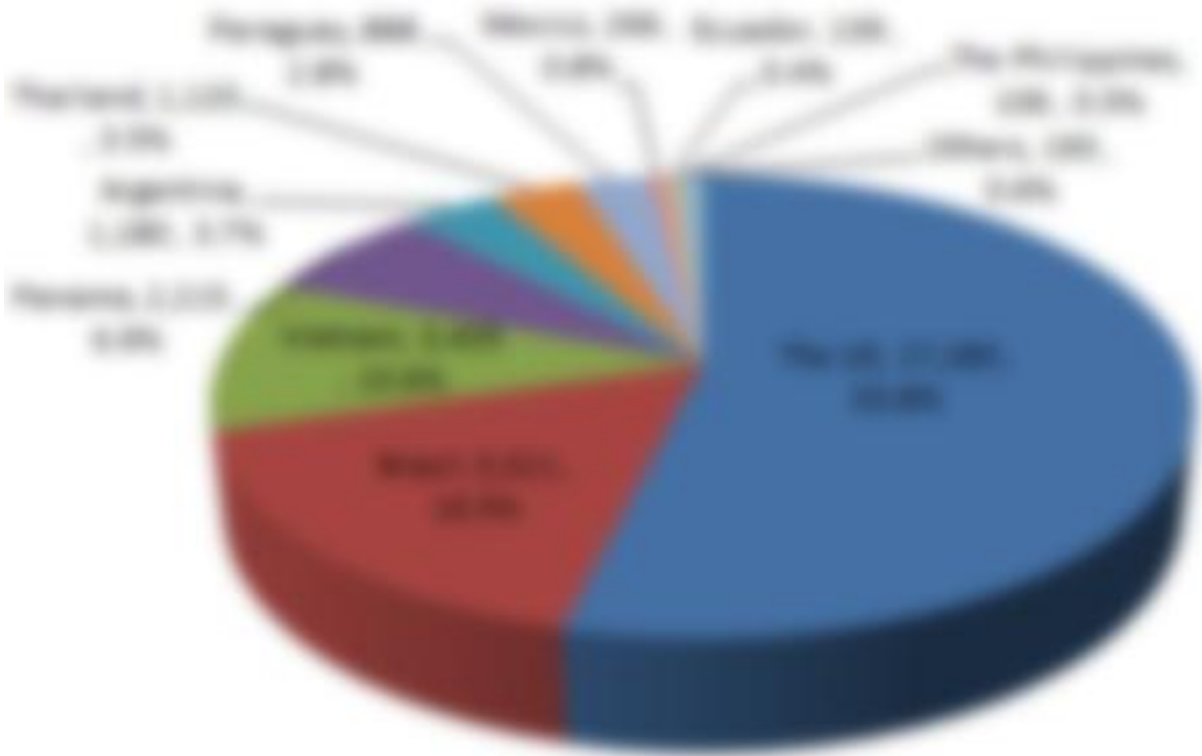
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China exports both glufosinate-ammonium technical and formulation products. During XXXX–XXXX, export volume of technical products has on average accounted for XX.X% of China's glufosinate-ammonium export. In XXXX, as the total export volume decreased, share of formulations slightly increased and took up less than XX% of the total. In XXXX, the technical export volume witnessed significant growth in share and accounted for XX.X%, leaving XX.X% for formulation.

In XXXX, producers have been more concentrated on XX% technical and XXXg/L AS production, the dominant specifications of glufosinate-ammonium products exported from China.

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Figure 4-1 Export destinations of China's glufosinate-ammonium by volume and share, 2022, tonne



Note:1. All the volumes are calculated by 100% technical.  
 2. Due to rounding, the total share may not equal 100%.  
 Source:Tranalysis

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#### 4.1 Export of glufosinate-ammonium technical in China, 2018–2022

Table 4.1-1 Export volume of glufosinate-ammonium technical in China by month, 2021–2022, tonne

Month	2021	2022	YoY change
XXXX	XXXXXXXX	XXXXXXXXXX	XXXXXX
XXXX	XXXXXXXX	XXXXXXXXXX	XXXXXXX
XXXXX	XXXXXXXX	XXXXXXXXXX	XXXXXXX
XXXXX	XXXXXXXX	XXXXXXXXXX	XXXXXXX
XXX	XXXXXXXX	XXXXXXXX	XXXXXX
XXXX	XXXXXXXX	XXXXXXXXXX	XXXXXXX
XXXX	XXXXXXXX	XXXXXXXXXX	XXXXXXX
XXXX	XXXXXXXX	XXXXXXXXXX	XXXXXXX
XXXXX	XXXXXXXX	XXXXXXXXXX	XXXXXXX
XXXX	XXXXXXXX	XXXXXXXXXX	XXXXXXX
XXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXX
XXXX	XXXXXXXX	XXXXXXXXXX	XXXXXXX
XXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXX

Note:1. Export volume here refers to the total amount of four specifications, including 95% TC, 96% TC, 98% TC and 50% TK. All the volumes are calculated by 100% technical.

2. Since May 2020, China's export data are sourced from the customs of various destinations.

3. The data in Nov. and Dec. 2022 are estimated based on the average export data of the first ten months.

Source:Tranalysis

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## 4.2 Export of glufosinate-ammonium formulations in China, 2018–2022

Table 4.2-1 Export volume of glufosinate-ammonium formulations in China by month, 2021–2022, tonne

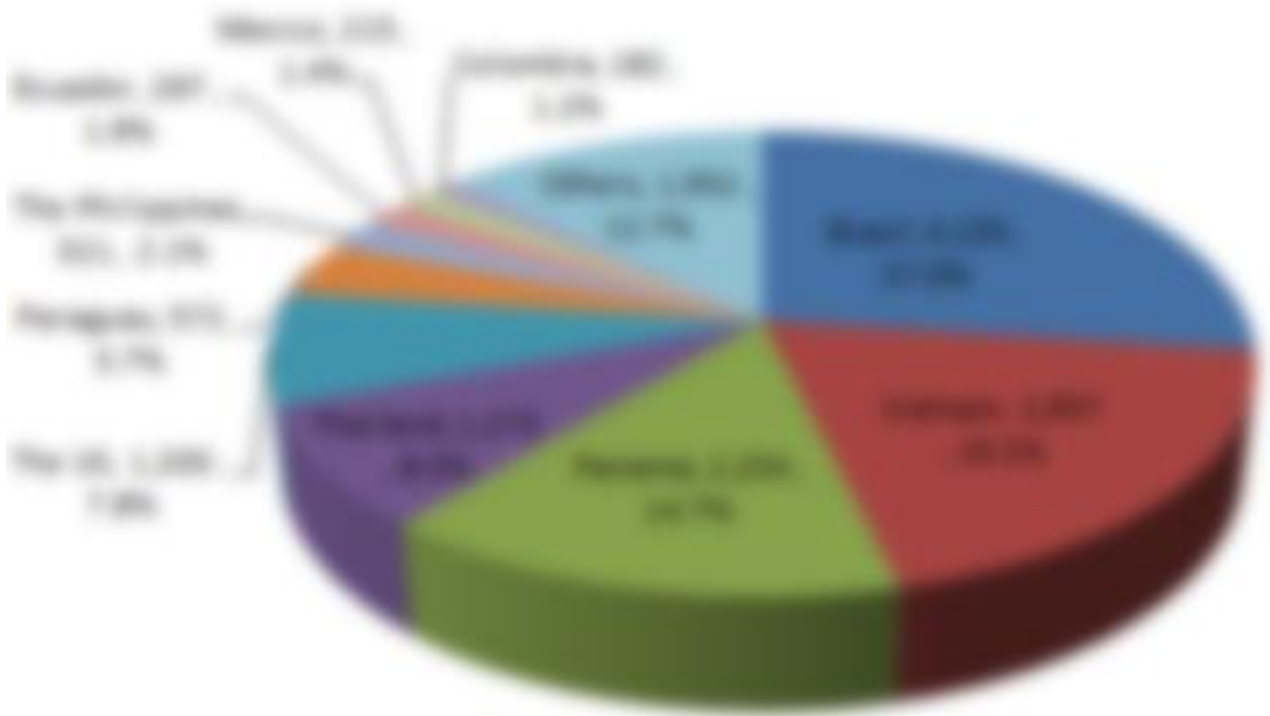
Month	2021	2022	YoY change
XXXX	XXXXXX	XXXXXXX	XXXXXXXXXX
XXXX	XXXXXX	XXXXXXX	XXXXXXXXXX
XXXXX	XXXXXX	XXXXXXXXXX	XXXXXXXXXX
XXXXX	XXXXXXX	XXXXXXXXXX	XXXXXXXXXX
XXX	XXXXXXX	XXXXXXXXXX	XXXXXXXXXX
XXXX	XXXXXXX	XXXXXXXXXX	XXXXXXXXXX
XXXX	XXXXXX	XXXXXXXXXX	XXXXXXXXXX
XXXX	XXXXXX	XXXXXXX	XXXXXXXXXX
XXXXX	XXXXXX	XXXXXXX	XXXXXXXXXX
XXXX	XXXXXXX	XXXXXXX	XXXXXXXXXX
XXXX	XXXXXXX	XXXXXXX	XXXXXXXXXX
XXXX	XXXXXX	XXXXXXX	XXXXXXXXXX
<b>XXXXX</b>	<b>XXXXXXXXXX</b>	<b>XXXXXXXXXX</b>	<b>XXXXXXXXXX</b>

Note:1. Export volume here refers to the total amount of the formulations including 100g/L AS, 150g/L AS, 180g/L AS, 200g/L AS, 50%AS, 150g/L SL, 180g/L SL, 200g/L SL, 280g/L SL, 80% SG and 88% SG. All the volumes are calculated by 100% technical.  
 2. Since May 2020, China's export data are sourced from data of the customs of various destinations.  
 3. The data in Nov. and Dec. 2022 are estimated based on the average export data of the first ten months.  
 Source:Tranalysis

...



Figure 4.2-1 Export destinations of China's glufosinate-ammonium formulations by volume and share, 2018–2022, tonne

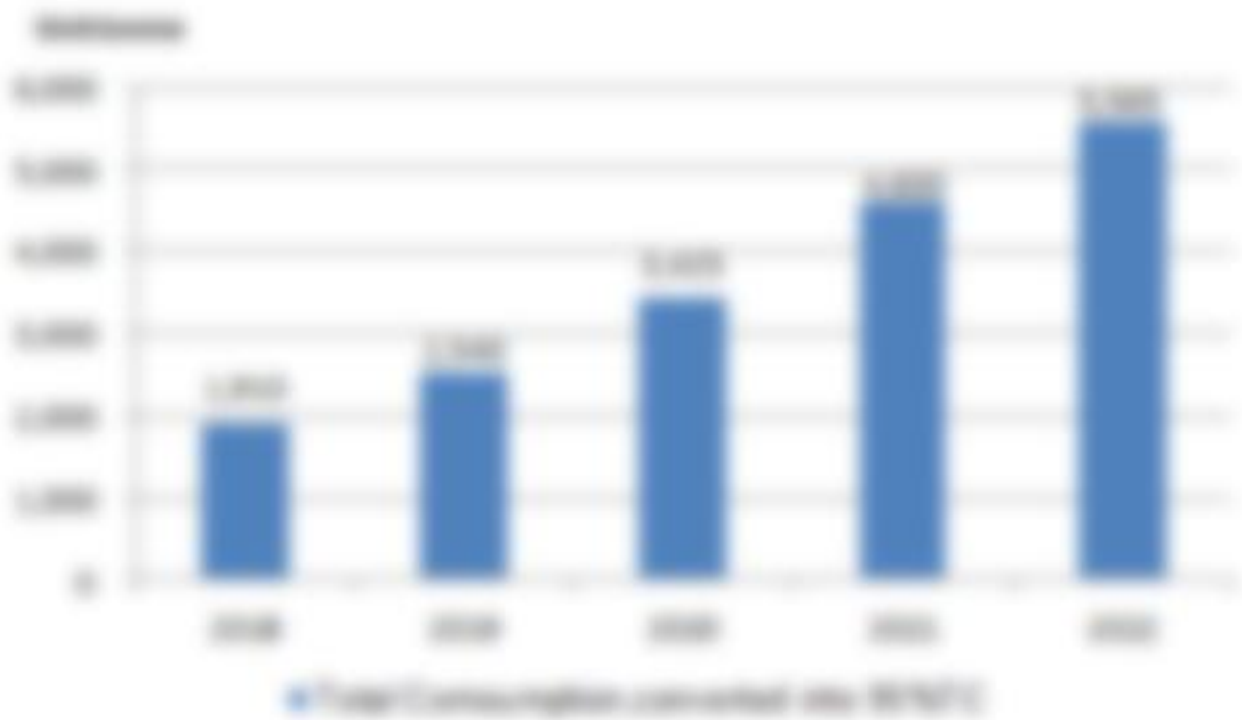


Note:1. Export volume here refers to the total amount of four formulations, including 100g/L AS,150g/L,AS 180g/L AS, 200g/L AS,50%AS,150g/L SL,180g/L SL,200g/L SL,280g/L SL,80% SG and 88% SG.  
 2. All the volumes are calculated by 100% technical.  
 Source:Tranalysis

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## 6 Domestic consumption

Figure 6-1 Consumption of glufosinate-ammonium in China, 2018–2022, 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

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Table 6-1 Planting areas of glufosinate-ammonium's main target crops in China, 2018–2022, '000 ha

Crop	2018	2019	2020	2021	2022
XXXXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
XXXXXXXXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
XXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
XXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
XXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
XXXXXXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
XXXXX XXXXXXXXXX XXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX

Source: National Bureau of Statistics of China & CCM

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