

Phosphate fertilizers in China

The First Edition

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Executive summary

Faced with increasingly stringent environmental standards, fierce competition and other factors, China's phosphate fertilizer industry structure has been continuously optimized and upgraded. In 2019–2020, the production of China's phosphate fertilizer witnessed a downward trend, the output (converted to 100% P₂O₅) decreased greatly, to 10,571,800 tonnes in 2020 from 13,084,000 tonnes in 2019.

- Production

As the world's largest producer of phosphate fertilizers, the capacity of MAP and DAP were 18,460,000 t/a and 22,050,000 t/a respectively as of 2021. In 2021, China's MAP output increased slightly to 15,473,000 tonnes, but the output of DAP decreased by 7.5% year on year to 13,544,000 tonnes. Domestic MAP and DAP production is mainly distributed in Western China with abundant phosphate ore supply, such as Yunnan, Guizhou and Sichuan Provinces.

- Consumption

The China's consumption of MAP saw a downtrend in 2019–2021, and the annual share of MAP consumption in Western China accounted for 35%–37% of the total in the past three years. It is estimated that the share in Western China will increase to nearly 40% in the future. In 2019–2021, China's DAP consumption fluctuated, and the annual share of DAP consumption in Western China decreased in the past three years, to about 34.6% of the total in 2021. It is estimated that the share in Western China will continue to decline in the future.

- Import and export

In 2019–2021, China's MAP and DAP import volume was less than export. China's export volume of MAP kept increasing, with 2021 MAP export volume increasing to 3,785,796 tonnes, up by 49.6% year on year. Also, export is an important consumption direction of DAP in China, with an annual export volume about 40% of the total output. In 2021, China's export volume of DAP was 6,254,733 tonnes, up by 9.1% year on year.

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 compilation and analysis of the obtained information. Where necessary, checks have been made with Chinese suppliers regarding market information such as key producers, key end users, production, export and demand and so on.

2) Telephone interview

CCM has carried out extensive telephone interviews in order to survey the actual market situation of titanium dioxide industry in China.

Interviewees cover:

- Key producers
- Key end users
- Key traders
- Material suppliers
- Some associations
- Experts

3) Site visit

CCM has visited some industry experts in order to obtain the experts' thorough views and investment suggestion.

4) Network

CCM adopts network to contact with players in this industry by B2B website and software.

Data processing and presentation

The data collected and compiled were sourced from:

- CCM's ValoTracer database
- Published articles from periodicals, magazines and journals, the third database
- Statistics from governments and international institutes
- Telephone interviews with domestic producers, joint ventures, service suppliers, government
- Questionnaire
- Third-party data providers
- Custom statistics
- Comments from industrial experts
- Professional database 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 it.

Unit

RMB: currency unit in China, also called Yuan

USD: currency unit in the US

tonne: ton, equals to metric ton in this report

/t: per tonne

t/a: tonne/annum or tonne/year

Glossary

CAGR: Compound Annual Growth Rate

Table 1: Region distributed of Chinese mainland

Region	Province
Western China	Inner Mongolia, Guangxi, Chongqing, Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang
Central China	Shanxi, Anhui, Jiangxi, Henan, Hubei, Hunan
Eastern China	Beijing, Tianjin, Hebei, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, Hainan, Liaoning, Jilin, Heilongjiang

Source: National Bureau of Statistics

Table 2: USD/CNY exchange rate, Jan. 2019–Dec. 2021

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

The dynamics of phosphate fertilizer enterprises in western China are as follows:

In Feb. 2019, Guizhou Kailin Group Co., Ltd. produced value-added diammonium phosphate (DAP) containing zinc boric acid, making it the first company in China to produce the product. Nucleotide and trace elements such as zinc and boron are added to 57% DAP. The product has good water solubility, and its main effect is to improve the utilization of nutrients by crops.

In Oct. 2019, Sinochem Chongqing Fuling Chemical Co., Ltd. stopped production of its phosphate fertilizer plant located on Longqiao Street, Fuling District in Chongqing and planned to move to Baitao Industrial Park. The relocation project adopted the internationally advanced wet phosphoric acid process, phosphoric acid purification technology and potassium dihydrogen phosphate technology to build high-end fine phosphate products and new ecological special fertilizer plant which was encouraged by China, forming the capacity of 900,000 t/a products, including potassium dihydrogen phosphate 50,000 t/a, fire retardant materials 150,000 t/a, multi-element physiological acid fertilizer 300,000 t/a, slow available compound fertilizer 400,000 t/a.

In Feb. 2020, Yunnan Tian'an Chemical Industry Co., Ltd., a subsidiary of Yunnan Yuntianhua Co., Ltd., planned to carry out a technical transformation of 100,000 t/a water-soluble monoammonium phosphate (MAP) for agricultural use. The project was technically modified based on the existing 220,000 t/a MAP plant, by removing some idle equipment and adding some new equipment. The 220,000 t/a MAP device has been transformed into a multi-functional device, capable of producing 120,000 t/a powder MAP and 100,000 t/a water-soluble MAP for agricultural use. As of 31 Dec., 2021, the project has been completed.

In April 2020, Yunnan Xiangfeng Fertilizer Co., Ltd. implemented the environmental protection relocation of 300,000 t/a special compound fertilizer quality upgrading project. The first phase of the project, including 200,000 t/a single superphosphate (SSP) and 100,000 t/a amino acid compound fertilizer, has been put into production in May 2021. In addition, the project upgraded the production line and process technology with green, serialization and intelligence.

In Feb. 2021, CNNC Hua Yuan Titanium Dioxide Co., Ltd. tended to invest in the construction of water-soluble MAP (water-soluble fertilizer) resource cycle project through its wholly-owned subsidiary, Gansu Dongfang Titanium Industry Co., Ltd. The project is divided into two phases of construction. After completion, 500,000 t/a water-soluble MAP (water-soluble fertilizer), 50,000 t/a nitrogen phosphate fertilizer, 15,000 t/a sodium fluosilicate and 500,000 t/a phosphogypsum products will be constructed.

In April 2021, Guizhou Chuanhen Chemical Corporation publicized the technical transformation of the 50,000 t/a fertilizer grade ammonium polyphosphates to multi-functional production of 80,000 t/a MAP. The project proposed to expand an 80,000 t/a production line based on the existing one of 50,000 t/a ammonium polyphosphate and 90,000 t/a MAP.

In Nov. 2021, Guangxi Luzhai Fertilizer Co., Ltd. planned to dismantle 240,000 t/a of DAP, 100,000 t/a of MAP and 100,000 t/a of SSP and other devices.

In April 2022, Luntai Stanli Fertilizer Co., Ltd. intended to upgrade the 200,000 t/a compound fertilizer plant to reduce energy consumption, improve the water solubility of compound fertilizer products and increase the fertilizer efficiency.

In June 2022, Xinjiang Taiwo Fertilizer Technology Co., Ltd. planned to build 200,000 t/a of new ecological and environmentally friendly crop fertilizer.

In Oct. 2022, the first phase of Gansu Xinlianxin Modern Agricultural Science and Technology Co., Ltd. (Gansu Xinlianxin)'s 140,000 t/a compound fertilizer by prilling tower process, 30,000 t/a water-soluble fertilizer and 10,000 t/a liquid fertilizer projects was put into operation. At the same time, the second phase project of 60,000 t/a fertilizer by drum granulator process and 60,000 t/a fertilizer by extrusion granulation process was under the construction. The project will apply the new automatic upgrading technology. Besides, relying on the rich resources of MAP, urea, ammonium chloride and other compound fertilizer raw materials in Gansu province, as well as the company's technical advantages and production experience in the compound fertilizer industry, Gansu Xinlianxin built a capacity of 300,000 t/a new crop fertilizer production line. This project has laid a foundation for Gansu Xinlianxin to further expand the northwest China markets in Gansu, Ningxia, Qinghai and Inner Mongolia provinces.

Policies in western China:

In Feb. 2021, Guizhou Province released the *Outline of the 14th Five-Year Plan (2021-2025) for National Economic and Social Development of Guizhou Province and the Long-Range Objectives Through the Year 2035*, accelerating the construction of world-class phosphorus chemical industry cluster, promoting the fine development of phosphorus chemical industry, scientific and rational development and utilization of phosphate ore resources, and enhancing the development of water-soluble fertilizer, slow available compound fertilizer, organic-inorganic compound fertilizer and other new fertilizers. The Province will vigorously develop the wet purification of phosphoric acid deep processing products and yellow phosphorus post-processing products, and improve the utilization of phosphate ore co-associated resources and the proportion of phosphogypsum comprehensive utilization.

In March 2021, Inner Mongolia issued the *Several Safeguard Measures to Ensure the Completion of the Targets and Tasks of the 14th Five-Year Plan for Dual Control System of Total Energy Consumption and Energy (Draft for Comments)*, which proposed that from 2021, Inner Mongolia would no longer approve new production capacity projects in the high pollution and high energy consumption industries, such as MAP, DAP and yellow phosphorus. If the construction is really necessary, the replacement of capacity and energy consumption reduction should be implemented within the region.

In May 2022, the *Implementation Opinions of the General Office of the Yunnan Provincial People's Government on Promoting the Withdrawal of Backward and Low-end and Inefficient Production Capacity* mentioned the iron and steel, building materials, non-ferrous metals, petrochemical and chemical industries (including MAP, DAP and yellow phosphorus) that are explicitly required by the state to control the total production capacity. Yunnan Province will encourage and support enterprises to build projects with low energy consumption, low emissions and advanced production technology and equipment through replacement of the same or reduced production capacity, to create a positive interaction mechanism between eliminating backwards and developing advanced technologies.

China's phosphate fertilizer industry has entered a mature stage of development, and China has become a major producer, consumer and exporter of phosphate fertilizers in the world. However, the industry is faced with many problems such as oversupply, the decline of the industry profit, the increase of money-losing enterprises, and increasing number of production enterprises. Under the influence of environmental policy regulation, demand fluctuation, fierce market competition and other factors, the elimination of backward capacity of phosphate fertilizer industry in China is accelerating, and the construction of new capacity is limited. Consequently, the industry concentration is further increased. Besides, by accelerating the transformation and upgrading of green development, phosphate fertilizer enterprises developed their products into diversified, functional and specialized ones.

2 Supply and Demand

2.1 Brief induction

Phosphate fertilizers are chemical fertilizers containing phosphorus and can be divided into water-soluble phosphate fertilizers, citrate-soluble phosphate fertilizers and insoluble phosphate fertilizers, in terms of solubility and availability to plants.

- **Water-soluble phosphate fertilizers:** the most widely used phosphate fertilizers with a wide range of applications and easy absorption into the soil. The main products include MAP, DAP, SSP and triple superphosphate (TSP), etc.
- **Citrate-soluble phosphate fertilizers:** a fertilizer with good physical properties, insoluble in water, but soluble in weak acids, such as 2% citric acid. The main products include fused calcium-magnesium phosphate (FMP), thomas phosphatic fertilizer and precipitated phosphate.
- **Insoluble phosphate fertilizers:** a highly efficient phosphate fertilizer, insoluble in water, poorly soluble in weak acids but soluble in strong acids, with slow and long-lasting fertilizer effect. The main products include phosphate powder and bone meal.

Among them, MAP and DAP are the most widely used phosphate fertilizers in China, which together account for more than 85% of the total consumption. MAP is mainly used as a compound fertilizer with potassium nitrogen fertilizer, while DAP is applied directly. Other phosphate fertilizers less used in China are mainly exported.

China's phosphate fertilizer industry started in the 1880s. Since 1994, preferential policies have been implemented for fertilizer production and circulation, including state tax exemption, preferential shipping rates, electricity prices, or gas prices, etc.

Entering 2000, with favorable policies and 10-year development, the phosphate fertilizer industry entered a mature period. However, due to the low entry threshold, the industry surplus gradually emerged. In addition, excessive and blind use of chemical fertilizers also brought cost increases and environmental pollution. As a result, China's phosphate fertilizer industry has turned from self-sufficiency to overcapacity since 2008.

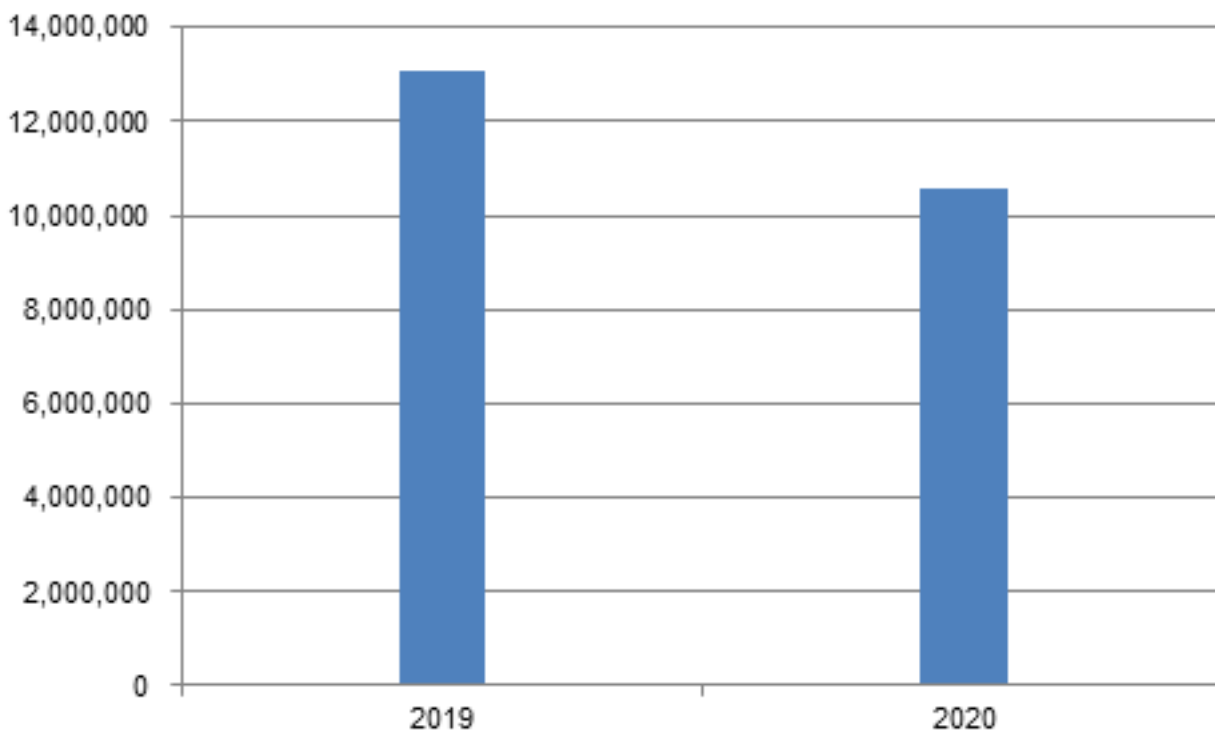
In 2012, China's phosphate fertilizer sector began to reduce capacity, and the growth rate of output slowed down. Since 2015, China has gradually cancelled the preferential policies for fertilizer enterprises and launched the *Action Plan for the Zero Growth of Chemical Fertilizer Use by 2020*, striving to achieve negative growth of chemical fertilizer utilization by 2020.

In April 2019, China's Ministry of Ecology and Environment issued the *Action Plan for the Special Investigation and Rectification of "Three Phosphorus" in the Yangtze River*, instructing provinces including Hubei, Sichuan, Guizhou, Yunnan, Hunan and Jiangsu as well as Chongqing Municipality to carry out intensive investigation and rectification on phosphate rock, phosphorus chemical enterprises, and phosphogypsum reservoirs. The "Three Phosphorus" regulation prompted the elimination of small and medium-sized backward capacity, which had a significant impact on the domestic phosphate fertilizer industry.

In April 2022, China issued the *Guiding Opinions on Promoting High-quality Development of the Petrochemical and Chemical Industries in the 14th Five-Year Plan (2021–2025)* to strictly control the new capacity of MAP and DAP, and accelerate the withdrawal of inefficient and backward capacity.

According to National Bureau of Statistics (NBS), the output of phosphate fertilizer (converted to 100% P₂O₅) in China dropped from 13,084,000 tonnes in 2019 to 10,571,800 tonnes in 2021, down by 19.2% YoY, mainly affected by domestic supply-side reform, environmental protection regulations and reduced downstream demand.

Figure 2.1-1 Output of phosphate fertilizers in China, 2019–2020, tonne



Note: 1. Converted to 100% P_2O_5 . 2. Data for 2021 is not available.
Source: NBS

2.2 MAP in China

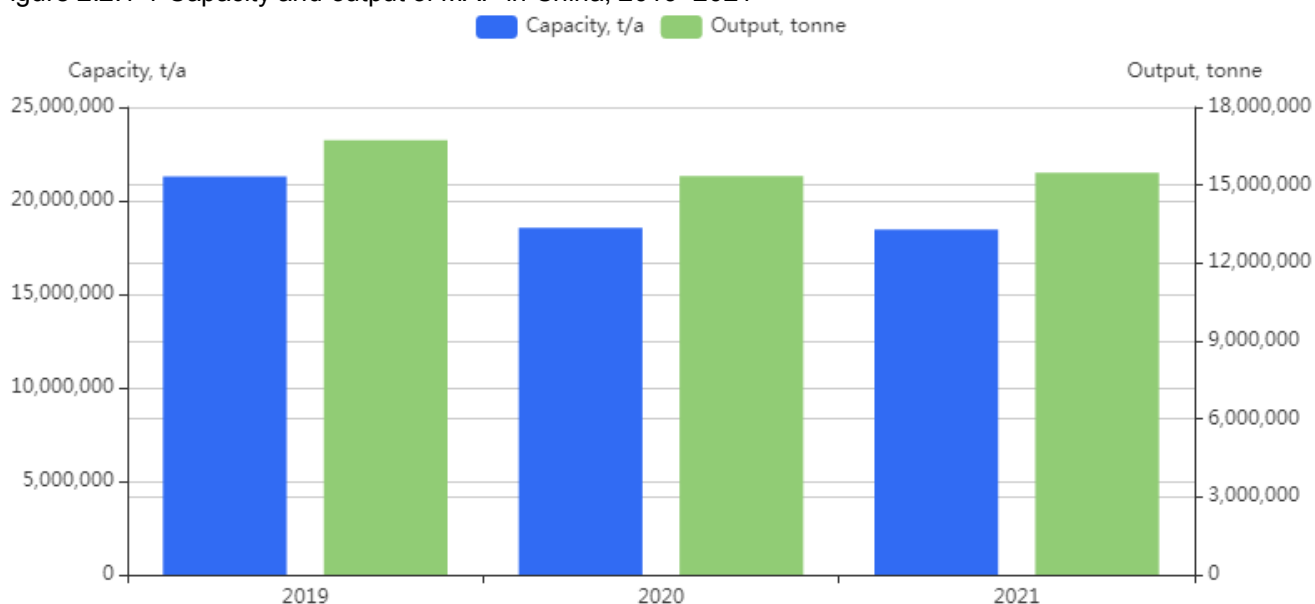
2.2.1 Production, 2019–2021

China's MAP industry has long suffered from overcapacity. In recent years, with the increasingly stringent environmental regulation and the deepening supply-side structural reform in China, some substandard enterprises have gradually withdrawn from the market and the new production capacity of phosphate fertilizers has been restricted. As a result, both capacity and output of China's phosphate fertilizers decreased significantly and are concentrated in the leading enterprises.

Since Jan. 2020, under the policies focusing on environmental protection of the Yangtze River and the special investigation and rectification action of the "Three Phosphorus" (phosphate rock, phosphorus chemical enterprise, and phosphogypsum reservoir) in the Yangtze River Economic Belt, some phosphate fertilizer enterprises in Hubei, Guizhou, Yunnan, Sichuan, Hunan, Chongqing, Jiangsu and other provinces had accelerated elimination of backward production capacity, leading China's MAP capacity to drop from 21,300,000 tonnes in 2019 to 18,460,000 tonnes in 2021, with a CAGR of -6.9%.

In 2019–2021, the output of MAP in China fluctuated. In 2020, the output of MAP dropped by 8.2% YoY to 15,350,000 tonnes, mainly affected by environmental protection regulations and the COVID-19 epidemic. In 2021, driven by increasing exports, the MAP output rose slightly.

Figure 2.2.1-1 Capacity and output of MAP in China, 2019–2021



Note: The calculation is based on actual volume.
Source: CCM

The capacity of MAP is mainly concentrated in central and western China, where phosphate ore is abundant. MAP enterprises in China are mainly located in Hubei, Yunnan, Sichuan, Anhui and Guizhou provinces.

In 2021, with the continuous elimination of backward production capacity, the production of MAP in China was increasingly concentrated. The top three producers produced a total of 3,905,500 tonnes, accounting for 25.2% of China's total MAP output, among which the amount of Xinyangfeng Agricultural Technology Co., Ltd. exceeded 1.5 million tonnes, ranking first in China.

Table 2.2.1-1 Production situation of MAP producers in China, 2019–2021

No.	Producer	Location	Capacity, t/a			Output, tonne		
			2019	2020	2021	2019	2020	2021
1	Xinyangfeng Agricultural Technology Co., Ltd.	Hubei Province	1,800,000	1,800,000	1,850,000	1,580,000	1,636,000	1,561,400
2	Hubei Xiangyun (Group) Chemical Co., Ltd.	Hubei Province	1,500,000	1,500,000	1,500,000	1,340,000	1,400,000	1,460,000
3	Anhui Sierte Fertilizer Industry Co., Ltd.	Anhui Province	850,000	850,000	850,000	753,600	809,300	884,100
4	Yunnan Yuntianhua Co., Ltd.	Yunnan Province	670,000	700,000	800,000	493,700	648,300	751,800
5	Sichuan Development Lomon Co., Ltd.	Sichuan Province	800,000	800,000	800,000	550,000	750,000	691,700
6	Guizhou Kailin Group Co., Ltd.	Guizhou Province	800,000	800,000	800,000	605,000	600,000	640,000
7	Hubei E-zhong Ecological Engineering Co., Ltd.	Hubei Province	700,000	700,000	700,000	420,000	480,000	530,000
8	Xiangyang Zedong Chemical Group Co., Ltd.	Hubei Province	535,000	535,000	535,000	405,000	450,000	480,000
9	Hubei Shilong Chemical Co., Ltd.	Hubei Province	500,000	500,000	500,000	360,000	400,000	420,000

10	Chengdu Wintrue Holding Co., Ltd.	Sichuan Province	430,000	430,000	430,000	491,800	524,700	491,800
11	Hubei Sanning Chemical Co., Ltd.	Hubei Province	360,000	360,000	360,000	353,900	352,800	374,400
12	Sichuan Hongda Co., Ltd.	Sichuan Province	360,000	360,000	350,000	298,000	364,000	259,000
13	Anhui Liuguo Chemical Co., Ltd.	Anhui Province	300,000	300,000	300,000	360,300	353,200	452,800
14	Hubei Fengli Chemical Co., Ltd.	Hubei Province	220,000	220,000	220,000	140,000	130,000	136,000
15	Hubei Xingfa Chemicals Group Co., Ltd.	Hubei Province	200,000	200,000	200,000	229,700	262,400	223,300
16	Yichang Xibu Chemical Co., Ltd.	Hubei Province	200,000	200,000	200,000	130,000	150,000	120,000
Others			11,075,000	8,305,000	8,065,000	8,216,000	6,039,300	5,996,700
Total			21,300,000	18,560,000	18,460,000	16,727,000	15,350,000	15,473,000

Note: The calculation is based on actual volume.

Source:CCM

2.2.2 Price

In 2019–2021, the ex-works price of China's MAP increased on the whole, and peaked in Aug. 2021, at USD534/t.

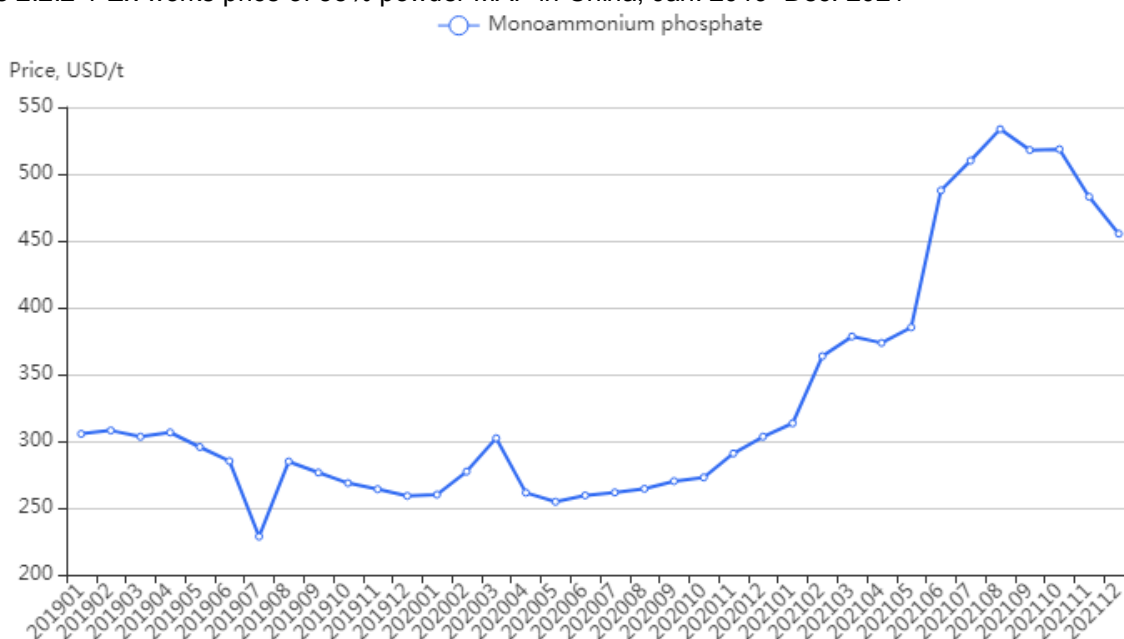
In 2019, the price showed a wavelike downtrend and hit a trough of USD229/t in July. The price drop was mainly due to weak demand and decreasing raw material prices.

In 2020, the price of MAP in China showed an "up-down-up" pattern, in which the price went up in Q1, fell back by May and then climbed to above USD300/t at the end of the year. In Q1, prices rose, supported by higher raw material prices and demand. However, prices declined slightly in Q2 due to weak demand. The demand for downstream remained weak, and the supply of MAP was sufficient. As a result, the price stayed stable in Q3. In Q4, there was an inflection point in the price change. MAP prices were boosted by positive factors such as tight supply and production costs.

In 2021, the price of MAP continued to rise from the beginning of the year. After rising to the highest price in Aug., the price began to dip to the end of the year, hit by slumping demand. In Jan.–Aug., prices rose for the main reasons as follows:

- High raw material prices: Both the price of sulfur and phosphorus ore continued to increase, resulting in higher production costs for MAP manufacturers.
- Tight supply: Due to the increase in production costs, the operating rate of MAP manufacturers declined, leaving the MAP market in short supply.

Figure 2.2.2-1 Ex-works price of 55% powder MAP in China, Jan. 2019–Dec. 2021



Source:CCM

2.2.3 Import and export

China is a net exporter of MAP. In 2019–2021, the export volume of MAP from China exceed 2 million tonnes.

During 2019–2021, China's MAP import was quite small, annual import volume of MAP was less than 25,000 tonnes. In this period, the import volume saw a decrease trend, dropping from 20,831 tonnes in 2019 to 27 tonnes in 2021.

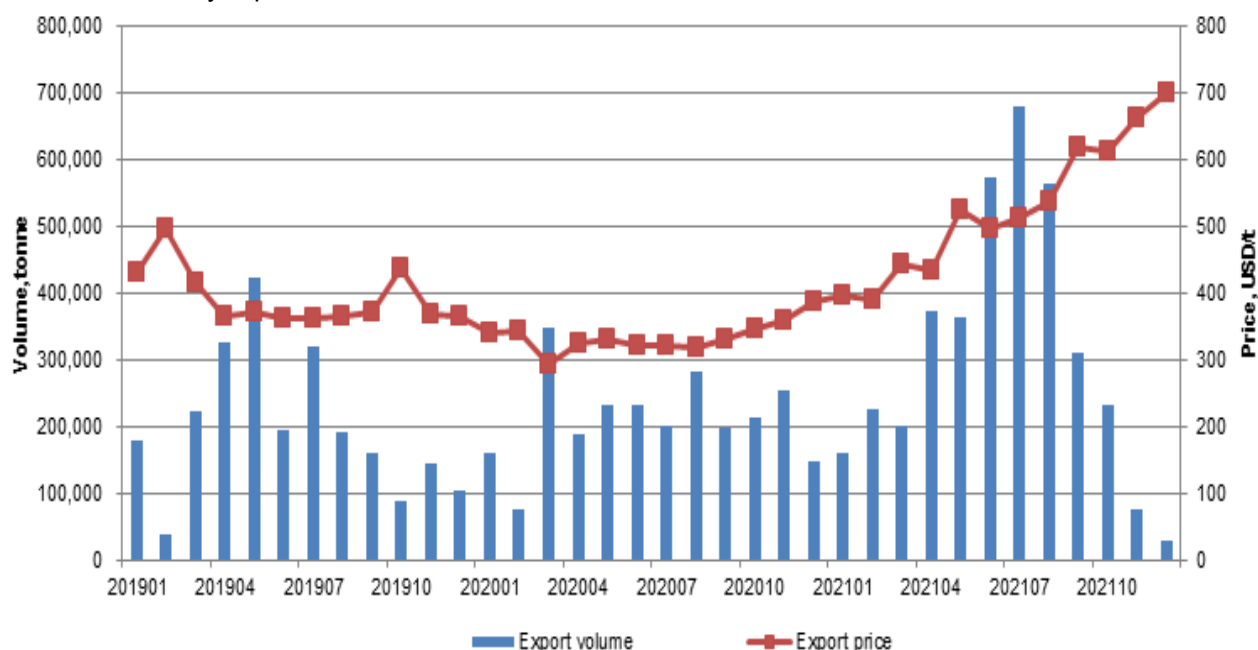
Table 2.2.3-1 Imports and exports of MAP in China, 2019–2021

Year	Import			Export		
	volume, tonne	Value, USD	Price, USD/t	volume, tonne	Value, USD	Price, USD/t
2019	20,831	5,139,844	247	2,391,366	909,067,751	380
2020	13,149	2,929,598	223	2,530,497	836,353,386	331
2021	27	19,331	724	3,785,796	1,927,428,744	509

Source:China Customs

In 2019–2021, the export volume of MAP in China kept increasing generally. However, the export price fluctuated, reaching the lowest point in 2020. The low price in 2020 was mainly due to the price drop of raw material sulfur and international phosphate fertilizer. In 2021, both the export volume and export price of MAP in China increased significantly for the tight supply and high prices of international phosphate fertilizers.

Figure 2.2.3-1 Monthly exports of MAP from China, Jan. 2019–Dec. 2021



Source: China Customs

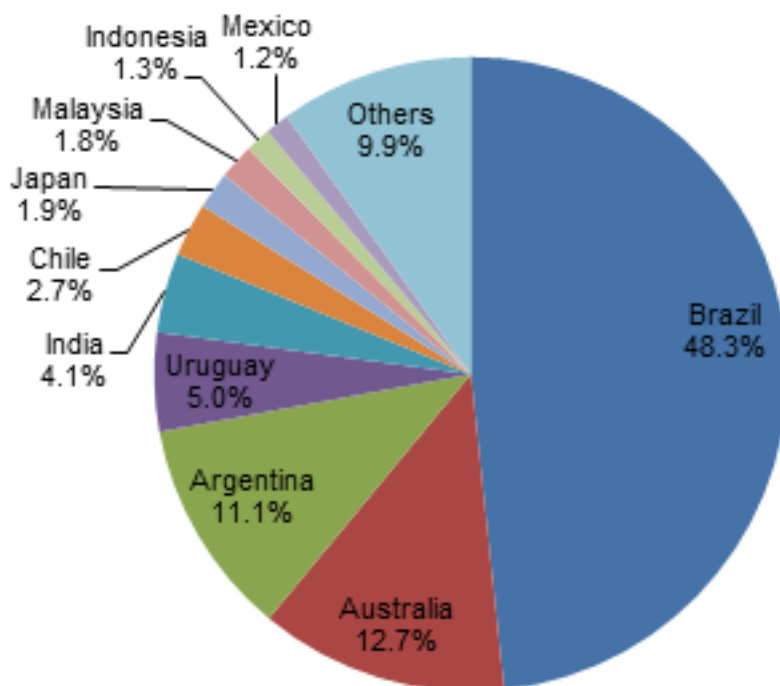
During 2019–2021, the top three export destinations for China's MAP exports exceeding 200,000 tonnes were Brazil, Australia and Argentina, with an upward trend. 2,729,077 tonnes MAP were exported to these three countries in 2021, accounting for about 72.1% of China's total MAP exports.

Table 2.2.3-2 Top ten export destinations of MAP in China, 2019–2021

No.	2019			2020			2021		
	Destination	Volume, tonne	Price, USD/t	Destination	Volume, tonne	Price, USD/t	Destination	Volume, tonne	Price, USD/t
1	Brazil	650,648	336	Brazil	694,182	277	Brazil	1,829,330	485
2	Australia	481,843	384	Australia	571,630	313	Australia	480,320	497
3	Argentina	294,467	344	Argentina	321,016	284	Argentina	419,427	509
4	India	157,104	405	India	134,750	386	Uruguay	190,519	508
5	Uruguay	100,776	364	Chile	97,759	331	India	153,558	594
6	Japan	77,844	396	Uruguay	91,248	270	Chile	103,343	535
7	Thailand	62,587	333	Japan	67,347	371	Japan	71,577	595
8	Taiwan, China	54,854	340	Malaysia	57,743	296	Malaysia	68,810	463
9	Malaysia	54,014	340	Taiwan, China	55,987	291	Indonesia	48,351	452
10	Chile	51,684	376	Turkey	47,696	523	Mexico	46,836	621
	Others	405,545	482	Others	391,140	464	Others	373,726	589
	Total/Average	2,391,366	380	Total/Average	2,530,497	331	Total/Average	3,785,796	509

Source: China Customs

Figure 2.2.3-2 Share of top ten export destinations of MAP in China, 2021



Source: CCM & China Customs

In China, the major exporters of MAP are located in Yunnan, Hubei, Guizhou, Beijing and Anhui Provinces.

In 2021, the province with the largest export volume is Yunnan, with the export volume of 1,112,818 tonnes, accounting for 29.4% of the total. Hubei Province followed with 828,363 tonnes, accounting for 21.9% of the total. Guizhou Province ranked third, with the export volume of 513,668 tonnes, taking up 13.6% of the total.

Table 2.2.3-3 China's MAP export volume by province, 2019–2021

No.	2019			2020			2021		
	Province	Export volume, tonne	Share	Province	Export volume, tonne	Share	Province	Export volume, tonne	Share
1	Yunnan	1,047,663	43.8%	Yunnan	1,038,462	41.0%	Yunnan	1,112,818	29.4%
2	Hubei	473,810	19.8%	Hubei	586,939	23.2%	Hubei	828,363	21.9%
3	Guizhou	285,912	12.0%	Guizhou	372,385	14.7%	Guizhou	513,668	13.6%
4	Sichuan	171,667	7.2%	Sichuan	212,660	8.4%	Beijing	356,522	9.4%
5	Anhui	122,838	5.1%	Anhui	137,182	5.4%	Anhui	277,769	7.3%
6	Chongqing	72,551	3.0%	Fujian	36,545	1.4%	Sichuan	200,874	5.3%
7	Fujian	71,415	3.0%	Beijing	34,372	1.4%	Fujian	193,116	5.1%
8	Beijing	50,885	2.1%	Heilongjiang	20,000	0.8%	Jiangsu	62,387	1.6%
9	Heilongjiang	32,964	1.4%	Hebei	15,108	0.6%	Shandong	57,442	1.5%
10	Hebei	19,039	0.8%	Chongqing	13,606	0.5%	Inner Mongolia	52,000	1.4%

Others	42,621	1.8%	Others	63,239	2.5%	Others	130,836	3.5%
Total	2,391,366	100.0%	Total	2,530,497	100.0%	Total	3,785,796	100.0%

Source: China Customs

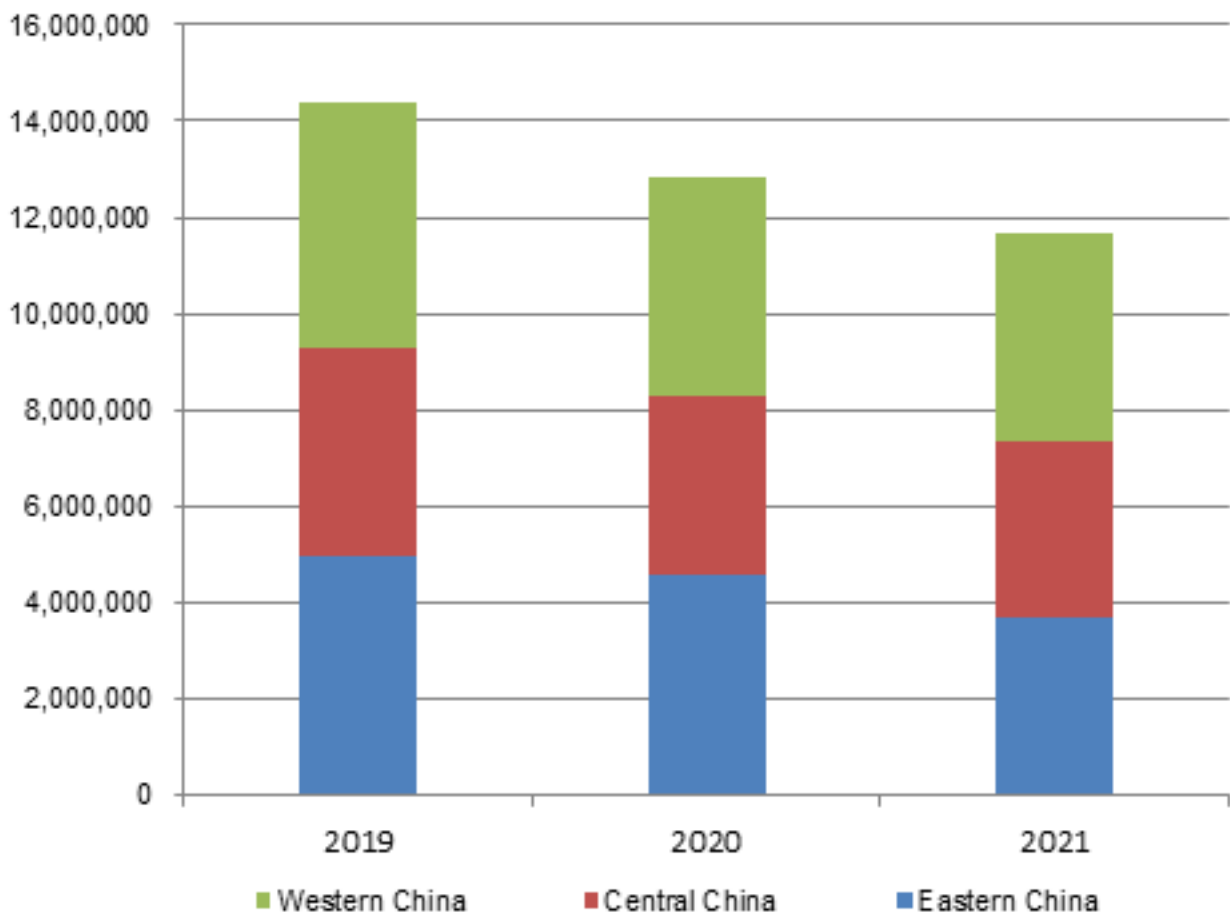
2.2.4 Consumption

In recent years, China has been advocating ecological agriculture, promoting the amount reduction and efficiency improvement of chemical fertilizers and pesticides, and advancing the replacement of chemical fertilizers with organic fertilizers. Also, the work of soil testing and formula fertilization, the optimization of chemical fertilizer input structure, and the promotion of efficient fertilizer application technology were progressing. Since 2014, the application of phosphate fertilizers in China has declined and stabilized with the improvement of fertilizer efficiency.

In China, most MAP is used in the production of compound fertilizers, and the application of compound fertilizers continues to increase with the fertilization structure changing, driving up the MAP demand. However, the growth in its demand has not kept pace with the decline in fertilizer application, due to the promotion of the amount reduction and efficiency improvement of chemical fertilizers and pesticides.

As a result, in 2019–2021 the MAP consumption in China saw a downtrend from 14,356,466 tonnes in 2019 to 11,687,230 tonnes in 2021, with a CAGR of -9.8%.

Figure 2.2.4-1 Apparent consumption volume of MAP in China by region, 2019–2021, tonne



Note: The calculation is based on actual volume.
Source: CCM

In 2019–2021, the consumption landscape of MAP in China changed slightly. The share of MAP consumption in Western China increased from 35.2% in 2019 to 37.3% in 2021; the share of consumption in Eastern China and Central China fluctuated, remaining at around 31% in 2021.

2.2.5 Production cost analysis

In 2021, the unit production cost of 55% powder MAP was about USD474, with the raw material costs accounting for 71.6% of the total.

Table 2.2.5-1 Raw material cost of 55% powder MAP in China, 2021

No.	Raw material	Consumption, unit/t	Unit	Price, USD/unit
1	Phosphorus ore (30%)	1.50	t	54
2	Sulfur	0.40	t	198
3	Synthetic ammonia	0.13	t	516
4	Others	1.00	t	111
Total				339

Source:CCM

Table 2.2.5-2 Manufacturing cost of 55% powder MAP in China, 2021

No.	Item	Unit cost, USD/t	
1	Raw materials	339	
2	Utilities	Water	1
		Coal	4
		Electricity	16
		Steam	5
3	Labor	10	
4	Packing	6	
5	Maintenance	2	
6	Depreciation	6	
Total		389	

Source:CCM

Table 2.2.5-3 Management cost of 55% powder MAP in China, 2021

No.	Item	Unit cost, USD/t
1	Salary of management staff and other auxiliary staff	2
2	Materials cost for management	1
3	Transportation cost	47
4	Distribution cost	4
5	Cost for three-waste treatment	3

6	Others	28
Total		84

Source:CCM

Table 2.2.5-4 Production cost of 55% powder MAP in China, 2021

No.	Item	Unit cost, USD/t
1	Manufacturing cost	389
2	Management cost	84
Total		474

Source:CCM

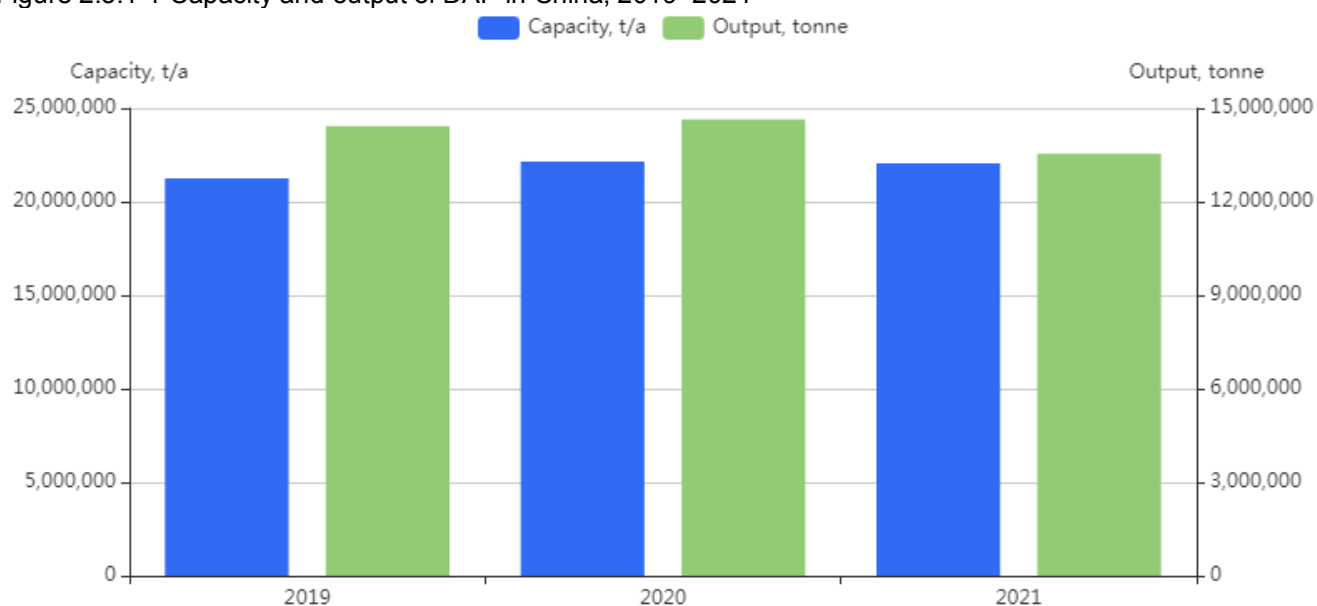
2.3 DAP in China

2.3.1 Production, 2019–2021

There is overcapacity in China's DAP industry. In 2019–2021, the capacity of DAP in China stayed at around 22 million t/a. However, the operating rate of DAP industry remained at low level, as some manufacturers that do not meet the requirements of environmental protection were in a state of production suspension for a long time. Besides, reduced downstream demand also contributed to the low operating rate.

In 2019–2021, China's DAP output fluctuated slightly, rising to 14,643,000 tonnes in 2020 and then dropping to 13,544,000 tonnes in 2021.

Figure 2.3.1-1 Capacity and output of DAP in China, 2019–2021



Note: The calculation is based on actual volume.

Source:CCM

The production of DAP in China is highly concentrated, with the capacity mainly located in Hubei, Yunnan and Guizhou Provinces.

Due to the improvement of environmental protection facilities, the operating rate of leading enterprises remains high, while that of some small and medium-sized enterprises is low.

In 2019–2021, the domestic top three producers were Yunnan Yuntianhua Co., Ltd., Guizhou Kailin Group Co., Ltd. and Hubei Yihua Chemical Industry Co., Ltd., which together produced more than half of the total

DAP output in China.

Table 2.3.1-1 Production situation of DAP producers in China, 2019–2021

No.	Producer	Location	Capacity, t/a			Output, tonne		
			2019	2020	2021	2019	2020	2021
1	Yunnan Yuntianhua Co., Ltd.	Yunnan Province	4,450,000	4,450,000	4,450,000	3,679,300	4,533,000	4,477,000
2	Guizhou Kailin Group Co., Ltd.	Guizhou Province	4,200,000	4,200,000	4,200,000	2,800,000	2,500,000	2,600,000
3	Hubei Yihua Chemical Industry Co., Ltd.	Hubei Province	1,400,000	1,260,000	1,260,000	1,260,000	1,296,000	1,427,000
4	Yunnan Xiangfeng Chemical Fertilizer Co., Ltd.	Yunnan Province	1,200,000	1,000,000	1,000,000	1,010,000	800,000	780,000
5	Hubei Xingfa Chemicals Group Co., Ltd.	Hubei Province	400,000	400,000	800,000	412,100	413,500	589,600
6	Hubei Dayukou Chemical Co., Ltd.	Hubei Province	830,000	830,000	830,000	540,000	750,000	550,000
7	Anhui Liuguo Chemical Co., Ltd.	Anhui Province	640,000	640,000	640,000	599,100	677,000	583,900
8	Hubei Dongsheng Chemical Group Co., Ltd.	Hubei Province	600,000	600,000	600,000	395,000	400,000	350,000
9	Gansu Jinchang Chemical Industry Group Co. Ltd.	Gansu Province	400,000	400,000	400,000	260,000	280,000	260,000
10	Hubei Sanning Chemical Co., Ltd.	Hubei Province	300,000	300,000	300,000	338,400	336,000	330,000
11	Hubei Huangmailing Phosphate Chemical Co., Ltd.	Hubei Province	300,000	300,000	300,000	230,000	250,000	210,000
12	Shandong Lubei Chemical Co., Ltd.	Shandong Province	300,000	300,000	300,000	180,000	180,000	160,000
13	Shaanxi Shanhua Coal Chemical Group Co., Ltd.	Shaanxi Province	250,000	250,000	250,000	200,000	220,000	200,000
Others			5,970,000	7,220,000	6,720,000	2,514,100	2,007,500	1,026,500
Total			21,240,000	22,150,000	22,050,000	14,418,000	14,643,000	13,544,000

Note: The calculation is based on actual volume.
Source: CCM

2.3.2 Price

In general, the ex-works price of DAP in China went down and then rose in 2019–2021.

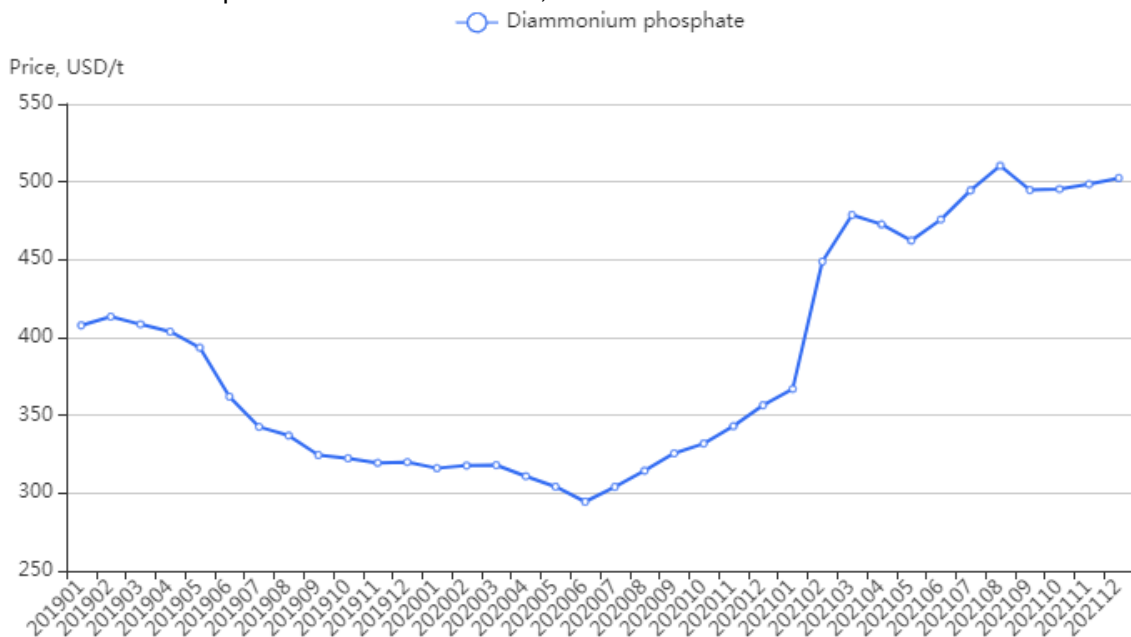
In 2019, the domestic DAP price declined steadily, dragged by weak demand and the continuous decline of international prices.

In Q1 2020, although the market supply decreased due to the impact of the COVID-19 epidemic, the government introduced a series of policies to ensure supply and stabilize prices. Thus, the ex-works price of DAP in China remained stable; In Q2, the price fell as the weak demand, while since July it continued to rise, mainly driven by increasing exports and domestic demand.

In 2021, the price of DAP in China increased overall: in Q1, the price surged, supported by tight supply, rising

raw material prices, and strong demand. But in April–May the situation took a turn for the worse because of insufficient demand. Since June, the price rose again and peaked at USD510/t in Aug., due to improved export markets and strong cost support. Subsequently, the DAP price levelled off in Q4.

Figure 2.3.2-1 Ex-works price of 64% DAP in China, Jan. 2019–Dec. 2021



Source:CCM

2.3.3 Import and export

Same as MAP, the export volume of DAP in China far exceeds the import volume.

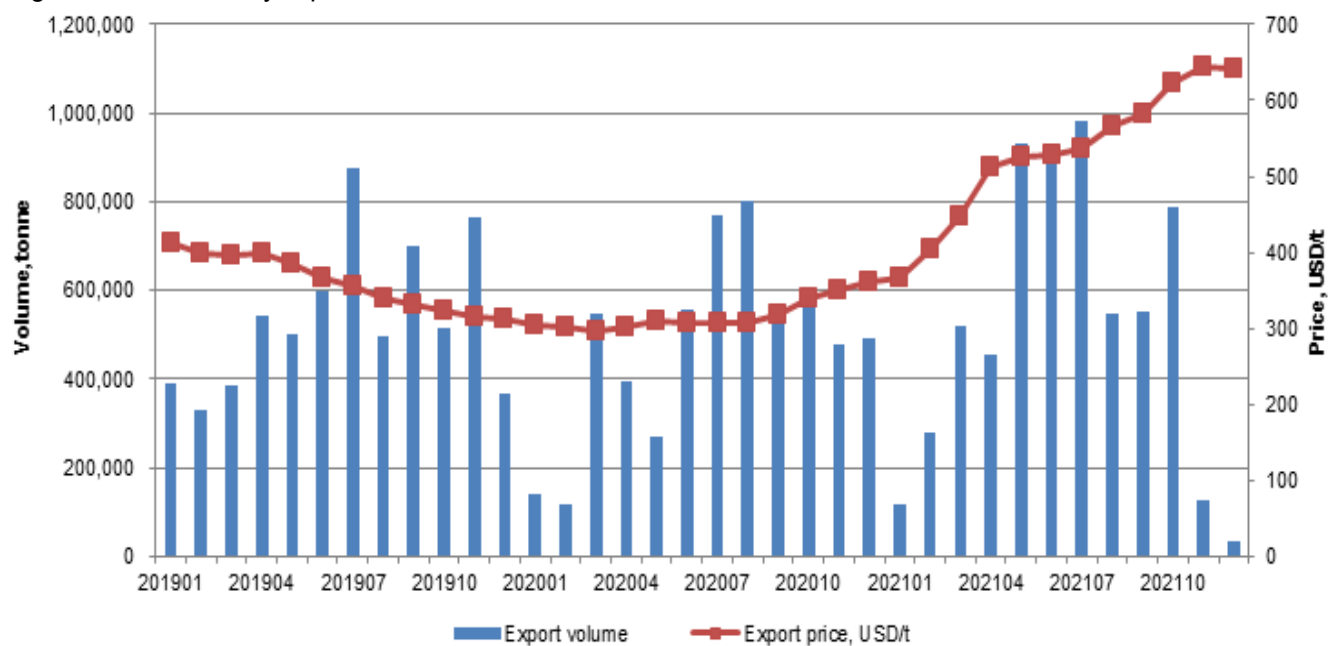
In 2019–2021, the annual export volume of DAP in China were about 6.5 million tonnes, 5.7 million tonnes and 6.3 million tonnes respectively, at export prices of USD357/t, USD319/t and USD535/t.

Table 2.3.3-1 Imports and exports of DAP in China, 2019–2021

Year	Import			Export		
	volume, tonne	Value, USD	Price, USD/t	volume, tonne	Value, USD	Price, USD/t
2019	2	13,800	8,214	6,475,003	2,312,900,732	357
2020	62,792	18,600,683	296	5,732,478	1,826,479,734	319
2021	5	32,757	5,964	6,254,733	3,347,837,553	535

Source:China Customs

Figure 2.3.3-1 Monthly exports of DAP in China, Jan. 2019–Dec. 2021



Source: China Customs

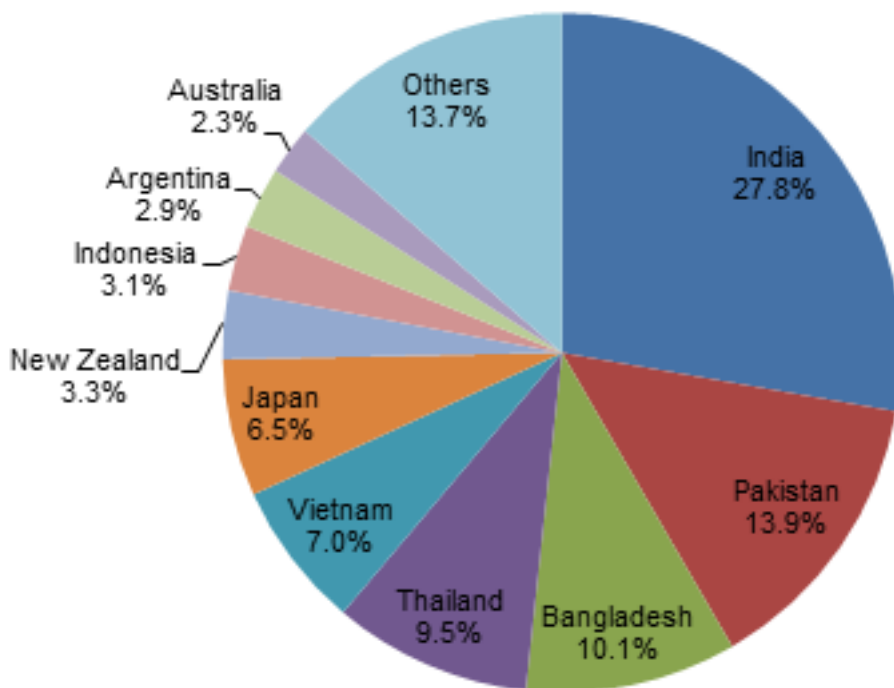
In terms of export destinations, China's DAP is mainly exported to India, Pakistan, Vietnam, Japan, Thailand, etc. In 2021, top three destination of China's DAP were India, Pakistan and Bangladesh, with the export volume of 1,736,497 tonnes, 867,714 tonnes and 629,855 tonnes respectively, accounting for 51.8% of the total export.

Table 2.3.3-2 Top ten export destination of DAP in China, 2019–2021

No.	2019			2020			2021		
	Destination	Volume, tonne	Price, USD/t	Destination	Volume, tonne	Price, USD/t	Destination	Volume, tonne	Price, USD/t
1	India	2,486,025	355	India	1,754,893	312	India	1,736,497	561
2	Pakistan	859,265	334	Pakistan	745,534	322	Pakistan	867,714	547
3	Vietnam	492,282	348	Vietnam	573,740	317	Bangladesh	629,855	533
4	Thailand	458,513	367	Thailand	483,343	315	Thailand	591,321	522
5	Japan	378,610	379	Japan	373,874	326	Vietnam	437,692	489
6	Indonesia	337,555	356	Bangladesh	344,243	330	Japan	408,841	544
7	New Zealand	284,159	352	New Zealand	321,601	323	New Zealand	203,806	590
8	Bangladesh	262,000	333	Indonesia	278,230	315	Indonesia	195,202	482
9	Australia	183,188	388	Australia	186,574	330	Argentina	183,450	520
10	The Philippines	102,221	347	The Philippines	128,402	321	Australia	145,224	527
	Others	631,186	389	Others	542,045	322	Others	855,130	505
	Total/Average	6,475,003	357	Total/Average	5,732,478	319	Total/Average	6,254,733	535

Source: China Customs

Figure 2.3.3-2 Share of top ten export destination of DAP in China, 2021



Source: CCM & China Customs

In terms of export provinces, the main exporters of DAP in China are located in Yunnan Province, Hubei Province, Guizhou Province, Beijing Municipality, Fujian Province, Anhui Province and so on.

In 2021, the DAP exporters in Hubei Province, ranking first among all DAP exporters in China, exported 1,975,013 tonnes of DAP, which account for 31.6% of the total; following that, the exporters in Yunnan Province exported 1,754,768 tonnes, which account for 28.1%; the exporters in Guizhou Province came in third and exported 1,093,314 tonnes, which take up 17.5%.

Table 2.3.3-3 China's DAP export volume by province, 2019–2021

No.	2019			2020			2021		
	Province	Export volume, tonne	Share	Province	Export volume, tonne	Share	Province	Export volume, tonne	Share
1	Yunnan	1,902,537	29.4%	Yunnan	2,267,884	39.6%	Hubei	1,975,013	31.6%
2	Hubei	1,586,981	24.5%	Hubei	1,436,045	25.1%	Yunnan	1,754,768	28.1%
3	Guizhou	1,087,494	16.8%	Guizhou	1,149,523	20.1%	Guizhou	1,093,314	17.5%
4	Fujian	613,260	9.5%	Fujian	267,149	4.7%	Beijing	313,864	5.0%
5	Beijing	248,515	3.8%	Chongqing	167,636	2.9%	Shanghai	290,985	4.7%
6	Anhui	239,359	3.7%	Inner Mongolia	119,712	2.1%	Fujian	231,626	3.7%
7	Liaoning	238,330	3.7%	Beijing	117,104	2.0%	Anhui	178,237	2.8%
8	Chongqing	137,505	2.1%	Anhui	59,964	1.0%	Chongqing	167,061	2.7%
9	Heilongjiang	106,000	1.6%	Shanghai	52,052	0.9%	Shandong	68,626	1.1%

10	Shanghai	81,203	1.3%	Jiangsu	38,948	0.7%	Inner Mongolia	55,532	0.9%
Others		233,818	3.6%	Others	56,462	1.0%	Others	125,708	2.0%
Total		6,475,003	100.0%	Total	5,732,478	100.0%	Total	6,254,733	100.0%

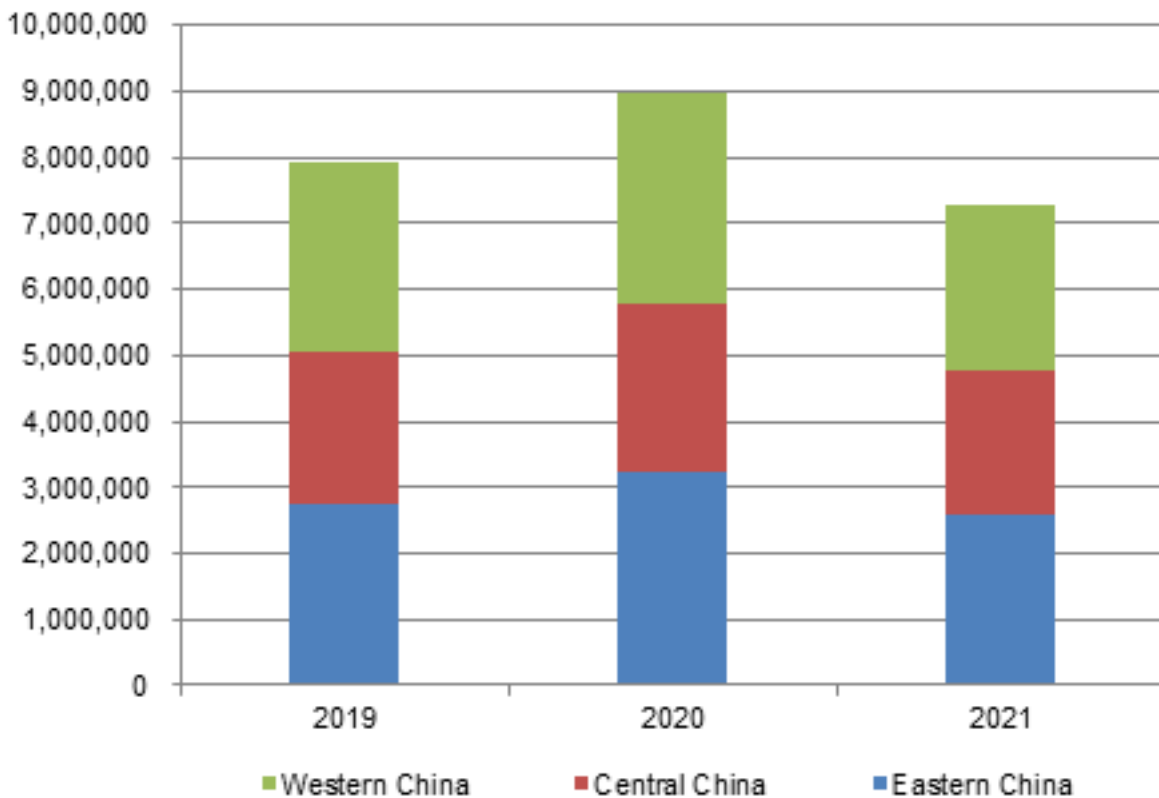
Source: China Customs

2.3.4 Consumption

Influenced by the adjustment of agricultural planting structure, the negative growth of chemical fertilizer application, the expansion of water-fertilizer integration technology and the development of new fertilizers, the fertilizer consumption layout is changing. The application of DAP decreased, while that of compound and new fertilizers increased instead. Therefore, DAP's market share was squeezed in China.

In 2019–2021, China's DAP consumption fluctuated and surged to 8,973,314 tonnes in 2020. But it fell by 18.8% YoY to 7,289,273 tonnes in 2021. During the same period, the consumption landscape of DAP in China had a slight change. The share of MAP consumption in Western China presented a decreasing trend and fell to 34.6% in 2021, while that in Eastern China and Central China fluctuated.

Figure 2.3.4-1 Apparent consumption volume of DAP in China by region, 2019–2021, tonne



Note: The calculation is based on actual volume.
Source: CCM

2.3.5 Production cost analysis

In 2021, the unit production cost of 64% DAP was about USD549, with the raw material cost accounting for 75.4% of the total.

Table 2.3.5-1 Raw material cost of 64% DAP in China, 2021

No.	Raw material	Consumption, unit/t	Unit	Price, USD/unit
1	Phosphorus ore (30%)	1.65	t	54
2	Sulfur	0.50	t	198
3	Synthetic ammonia	0.22	t	516
4	Others	1.00	t	111
Total				414

Source:CCM

Table 2.3.5-2 Manufacturing cost of 64% DAP in China, 2021

No.	Item	Unit cost, USD/t	
1	Raw materials	414	
2	Utilities	Water	1
		Coal	4
		Electricity	16
		Steam	5
3	Labor	10	
4	Packing	6	
5	Maintenance	2	
6	Depreciation	6	
Total		464	

Source:CCM

Table 2.3.5-3 Management cost of 64% DAP in China, 2021

No.	Item	Unit cost, USD/t
1	Salary of management staff and other auxiliary staff	2
2	Materials cost for management	1
3	Transportation cost	47
4	Distribution cost	4
5	Cost for three-waste treatment	3

6	Others	28
Total		85

Source:CCM

Table 2.3.5-4 Production cost of 64% DAP in China, 2021

No.	Item	Unit cost, USD/t
1	Manufacturing cost	464
2	Management cost	85
Total		549

Source:CCM

2.4 Other Phosphate fertilizers in China

As one of the single nutrient fertilizers with the highest concentration, TSP can be used as base fertilizer, topdressing fertilizer, seed fertilizer and the raw material of compound fertilizer. It is widely used in rice, wheat, corn, sorghum, cotton, fruits, vegetables and other food crops and cash crops. And it is applied to various soil qualities such as red soil, yellow soil and brown soil, especially in North China, Northeast China and Northwest China.

In China, TSP enterprises are mainly distributed in areas with rich phosphate ore resources, and about 80% of TSP capacity is concentrated in Yunnan Province.

China is one of the major producers and exporters of TSP. In 2021, China's TSP capacity was about 2.9 million t/a, with an output of 2.22 million tonnes. The consumption of TSP in China is small, accounting for about 5% of the total consumption of phosphate fertilizers. Therefore, China's TSP is mainly exported. In 2021, China exported 1,168,329 tonnes of TSP, accounting for more than half of the total output in 2021.

SSP is one of the low-concentration phosphate fertilizers in China. The capacity and output of SSP have been declining in recent years. The main factors limiting the development of SSP are as follows:

- Lower demand: The increasing output and market share of high-concentration phosphate fertilizers have led to a decrease in the demand for low-concentration phosphate fertilizers such as SSP. In addition, Ministry of Agriculture and Rural Affairs of China issued the *Action Plan for the Zero Growth of Fertilizer Use by 2020*, which led the consumption of SSP in some areas to reduce, or even accelerated the replacement of high-concentration phosphate fertilizers.
- Single effect and high costs: After years of development, the market share of compound fertilizers has gradually eaten away part of straight fertilizers, especially the low content of SSP. And when SSP or the compound fertilizer is applied to achieve the same effect, the former is much more costly.
- Challenging market: Stricter environmental protection regulations and more intense competition caused some small and medium-sized enterprises to operate under higher pressure or gradually withdraw from the market. For example, since 2018, SSP enterprises have been consolidated in Hubei Province, where 16 SSP enterprises in Jingmen City have been integrated into three; by 2021, the SSP production capacity eliminated has reached 1.4 million t/a.

Table 2.4-1 Imports and export of TSP in China, 2019–2021

Year	Import			Export		
	Volume, tonne	Value, USD	Price, USD/t	Volume, tonne	Value, USD	Price, USD/t
2019	0	/	/	1,205,825	362,743,872	301
2020	37,336	14,930,024	400	998,178	229,700,218	230
2021	0	/	/	1,168,329	458,050,901	392

Source:China Customs

Table 2.4-2 Exports of SSP in China, 2019–2021

Year	Volume, tonne	Value, USD	Price, USD/t
2019	550,003	107,822,997	196
2020	436,409	66,839,721	153
2021	816,676	146,247,062	179

Note: There were no imports of SSP into China during 2019–2021.
Source: China Customs

2.5 Transportation

Table 2.5-1 Rail transport costs for phosphate fertilizer producers to regions and ports in China

Producer	Western Province				Eastern port			
	Xinjiang (Yining City)		Inner Mongolia (Hohhot City)		Zhejiang (Ningbo City)		Guangdong (Guangzhou City)	
	Distance, Km	Cost, USD	Distance, Km	Cost, USD	Distance, Km	Cost, USD	Distance, Km	Cost, USD
Xinyangfeng Agricultural Technology Co., Ltd.	3,972.7	2,717.3	1,352.9	973.8	1118.69	818.0	1108.74	811.4
Sichuan Development Lomon Co., Ltd.	3,428.1	2,354.8	1,670.4	1,185.1	2016.3	1,415.3	1656.97	1,176.2
Guizhou Kailin Group Co., Ltd.	3,890.0	2,662.3	1,978.2	1,390.0	1733.98	1,227.4	1051.48	773.3
Yunnan Yuntianhua Co., Ltd.	4,249.2	2,901.3	2,435.0	1,693.9	2280.6	1,591.2	1388.13	997.3

Note: 1. The exchange rate in 2021: USD1.00=CNY6.4615 2. Calculated at 50 tonnes/time.
Source: CCM

Table 2.5-2 Rail transport costs from Yining City to eastern ports in China

Departure	Destination	Distance, Km	Cost, USD
Xinjiang (Yining City)	Zhejiang (Ningbo City)	4,724.9	3,217.8
	Guangdong (Guangzhou City)	4,874.5	3,317.4

Note: 1. The exchange rate in 2021: USD1.00=CNY6.4615 2. Calculated at 50 tonnes/time.
Source: CCM

2.6 Policy

Policy on import and export of finished fertilizer products

In Dec. 2018, the Customs Tariff Commission of China's State Council issued the *2019 Adjustment Plan for Provisional Import and Export Tariff Rates*. Since 1 Jan., 2019, China has implemented a provisional 1% tariff rate on the import quotas of three fertilizers (urea, compound fertilizer and ammonium hydrogen phosphate); export tariffs were no longer levied on all fertilizer commodities.

China's State Economic and Trade Commission and China Customs have formulated the *Interim Measures for the Administration of Import Tariff-rate Quotas of Fertilizers*. In recent years, the total quantity of imported fertilizer quotas maintained at 13.65 million, shared by 3.30 million tonnes of urea, 6.90 million tonnes of DAP and 3.45 million tonnes of compound fertilizers.

In Nov. 2020, China's Ministry of Commerce and China Customs issued the Announcement on Adjusting the Catalogue of Prohibited Commodities in Processing Trade. From 1 Dec., 2020, 199 products that are not

high energy-consuming and polluting, as well as products with high technology, were removed from the list of prohibited commodities for processing trade. There are 30 fertilizers, including urea, MAP, DAP, SSP, potassium chloride, potassium sulfate, and compound fertilizers (without ammonium nitrate component). Among them, 24 fertilizers are permitted for processing trade imports and exports and 6 containing ammonium nitrate are allowed to be exported through processing trade, with imports still prohibited.

In Sept. 2021, the National Development and Reform Commission issued the Notice on Implementation of Preferential Railway Tariff Policy for Agricultural Fertilizers Including Slow and Controlled Release Fertilizers: the lines of the national railways implementing uniform tariffs continue to apply the preferential tariffs for agricultural fertilizers and are exempt from the railway construction fund; 8 new-added fertilizer varieties such as slow-release fertilizers and water-soluble fertilizers enjoy preferential railway tariffs. The export of fertilizers and chemicals used in industrial production is not subject to preferential railway freight rates.

In Oct. 2021, China Customs issued *No. 81 Notice on Adjusting the Catalog of Import and Export Commodities Subject to Compulsory Inspection*. It decided to adjust the catalogue of import and export commodities that must be inspected, with effect from 15 Oct. 2021. Export commodity inspection shall be carried out on 29 fertilizers related to export, such as ammonium chloride, urea, ammonium nitrate, MAP, DAP, TSP, potassium chloride, potassium sulfate, chemical or mineral fertilizers (containing three fertilizer elements including nitrogen, phosphorus and potassium), organic-inorganic compound fertilizers. The export chemical fertilizers identified as hazardous chemicals shall also be inspected for export chemicals and the packaging of export hazardous chemicals under the relevant regulatory provisions for hazardous chemicals. Those that fail the inspection shall not be allowed to export.

Policy on import and export of raw material

In Oct. 2018, the Ministry of Commerce announced a notice on the 2019 administration of goods export quotas. Since 1 Jan., 2019, the export quota management of phosphate ore and silver has been suspended and adjusted to license management.

In April 2021, China issued the *Measures for the Administration of Import Tax Policies for the Exploration, Development and Utilization of Energy and Resources during the "14th Five-Year Plan" Period (2021–2025)*, proposing to support the import and utilization of natural gas, and that the imported natural gas in conformity with the regulations can apply for the return of the value-added tax on natural gas imports.

In Nov. 2021, the Ministry of Commerce published the *Catalogue of Technologies Prohibited or Restricted by China from Import*. From 2 Nov. 2021, China restricts the import of sulphuric acid production technologies, and the main restricted technologies include: sulphuric acid production technologies with a capacity of 600,000 t/a or less in a single series, using sulphur as feedstock; ones with a capacity of 400,000 t/a or less in a single series, using pyrite as feedstock.

In April 2022, in order to ensure energy supply and promote high-quality development, the Tariff Commission of the State Council announced that during 1 May, 2022–31 March, 2023, all coal imports will enjoy a provisional zero rate.

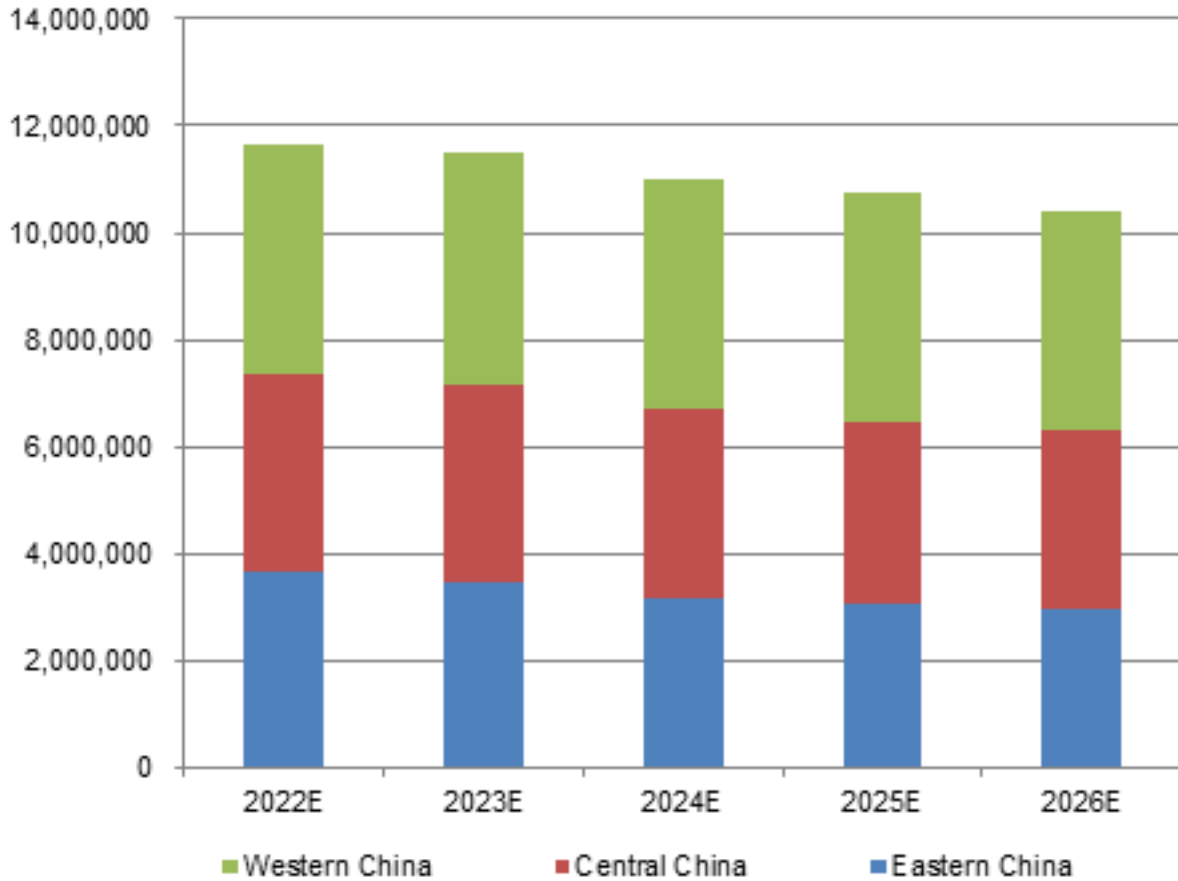
At present, there are no policy restrictions on the export of synthetic ammonia in China.

2.7 Consumption forecast, 2022–2026

In general, China will continue to reduce chemical fertilizer use during the 14th Five-Year Plan period (2021–2025). In addition, to protect the environment, China will also encourage the use of organic fertilizers and formulate organic fertilizer subsidy policies, improving the soil environment and increasing the utilization of organic waste resources. The growth of organic fertilizer market share will have a crowding out effect on the consumption of traditional chemical fertilizers, especially phosphate fertilizers.

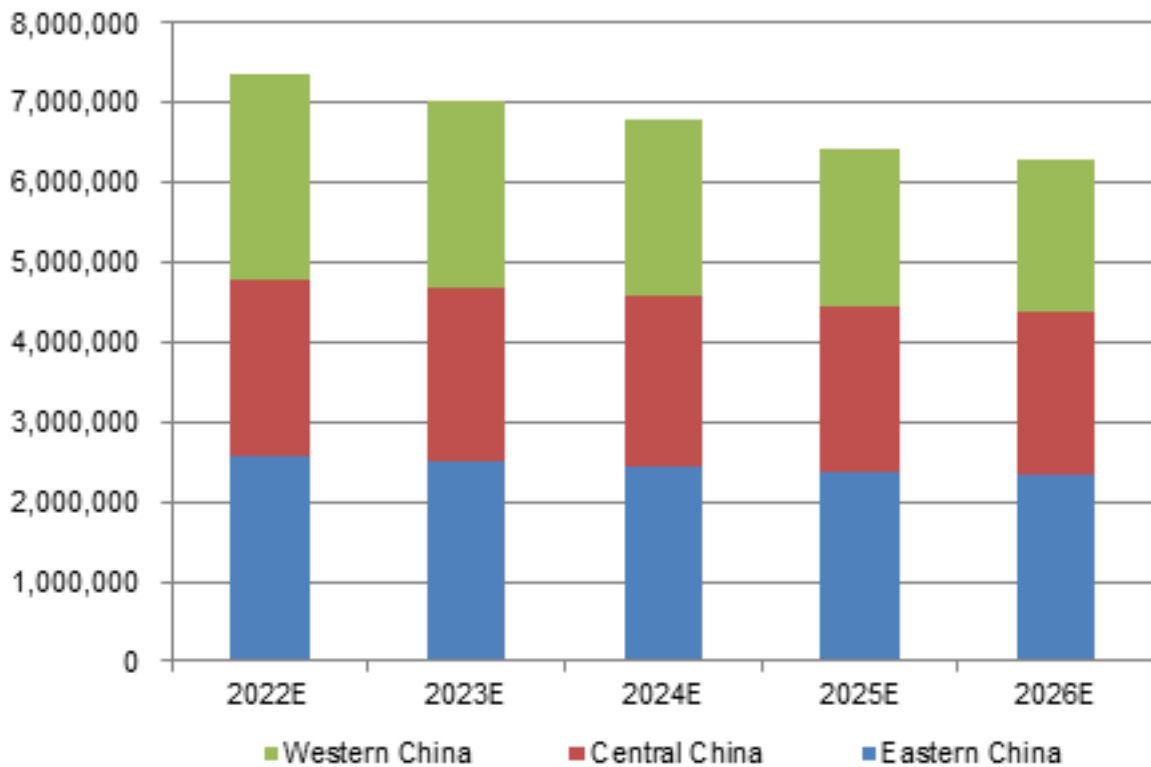
At present, China's phosphate fertilizers consumption has levelled off. Considering the rigid requirement of fertilizers and the food security, the consumption of phosphate fertilizers in China is expected to decrease slowly in 2022–2026. Specifically, the changes in MAP and DAP are different. Affected by the increasing demand for compound fertilizer, the change in MAP consumption is relatively small. The consumption volume of DAP in China is also estimated to go down, with a CAGR of -3.9% in 2022–2026. By region, the consumption share of MAP is expected to increase slightly in Western China, while DAP in Western China will steadily decline as it is squeezed by new fertilizers such as water-soluble fertilizers and drip irrigation fertilizers.

Figure 2.7-1 Forecast on consumption volume of MAP in China by region, 2022–2026, tonne



Source:CCM

Figure 2.7-2 Forecast on consumption volume of DAP in China by region, 2022–2026, tonne



Source:CCM

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