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**CURRENT SITUATION AND OUTLOOK
OF THE PHOSPHATE FERTILIZER INDUSTRY
IN CHINA**

by

**LIN Le
China Phosphate Fertilizer Industry Association
CHINA**

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Current Situation and Outlook of the Phosphate Fertilizer Industry in China

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Lin Le¹

China Phosphate Fertilizer Industry Association, China

1. ABSTRACT

This presentation reports the current situation of production, consumption, and trade of China's phosphate fertilizer industries. An outlook to the year 2005 is also made in this report on the policy and development of the phosphate fertilizer industry in China.

2. CURRENT SITUATION OF CHINA'S PHOSPHATE FERTILIZER INDUSTRIES

China's phosphate fertilizer production in the year of 2002 made up 24% of the world total production, ranked the second, following the United States only. While China's phosphate fertilizer consumption amounted to 27% of the world total, ranked the first. In general, domestic production of phosphate fertilizers can meet 85% of the demand now.

2.1 5.9% Yearly Average Increase of Phosphate Fertilizer Production in the Past Ten Years

The annual production of phosphate fertilizer was 4.55 million tonnes (Mt) P₂O₅ in 1992. It doubled to 8.06 Mt P₂O₅ in 2002, with a yearly average increase of 5.9% over the past ten years. Self-sufficiency extended from 70% to 85% respectively. The estimated annual production of phosphate fertilizer in 2003 is around 8.5 Mt P₂O₅. The first half-year output (Jan. – June) was 4.31 Mt P₂O₅.

2.2 Fast Growth of High Analysis Phosphate Compound Fertilizer Production both in Capacity and Output

World fertilizer market has long been suffered from over-supply, reduced price, and declining profits. No matter how severe the global situation may seem, China's phosphate industry forged ahead with a dynamic growth of high analysis phosphate compound fertilizer industry (MAP, DAP, NPK, NP, TSP) by making full uses of own resources and industrial base, and by adopting effective strategies, such as modernizing old facilities, upgrading technology, pioneering sunrise industries and promoting low-cost expansion of capacity etc.

¹ Address: No.1 Liu Pu Kang Jie, 100011 Beijing; Fax 86 10 82030002; E-mail: cpfiall @vip.sina.com

In 1992, the total actual output capacity of high-analysis phosphate compound fertilizers was only 2.25 Mt product. However, it increased to 8.5 Mt in 1997, and 19.3 Mt in 2002, of which mono-ammonium phosphate (MAP) accounted for 4.02 Mt, di-ammonium phosphate (DAP) - 4.48 Mt, NPK compound fertilizer (NPK) - 8.32 Mt, nitrophosphate (NP) - 1.05 Mt, granular triple superphosphate (TSP) - 1.40 Mt. The annual growth rate of capacity averaged close to 20% in recent five years.

In 2002 the actual output of high-analysis phosphate compound fertilizers totaled: MAP - 2.72 Mt, DAP - 2.67 Mt, NPK - 5.17 Mt, NP - 0.85 Mt, and TSP - 0.55 Mt. Meanwhile, the exported portion was around 6% of the total, including MAP - 0.13 Mt, DAP - 0.48 Mt, NPK - 0.10 Mt and TSP - 0.48 Mt. In 2003, the first six months actual output was: MAP - 1.42 Mt, DAP - 1.53 Mt, NPK - 3.33 Mt, NP - 0.41 Mt and TSP - 0.25 Mt.

2.3 Significant Change in Phosphate Fertilizer Product Structure

China's phosphate fertilizer industry was established since her liberation. Production of single superphosphate (SSP) was developed at first in 1950s'. Now, there is an annual output of around 3.7 Mt P_2O_5 , accounting for 47% of the total phosphate fertilizer production. In 1960s', the furnace technology of fused calcium magnesium phosphate (FMP) was developed domestically. Now, there is an annual output of FMP at 0.7 Mt P_2O_5 , or 8% of the total. From 1980s' till now, over 6 billion US dollars has been invested primarily to develop high-analysis phosphate compound fertilizers, using advanced technology both domestic developed and imported.

The high-analysis phosphate compound fertilizers production in 1992 was only 0.33 Mt P_2O_5 or 7% of the total. In 1997, it increased to 1.38 Mt P_2O_5 , or 21% of the total. In 2002, its output reached 3.68 Mt P_2O_5 , equating to 45% of the total phosphate production.

There is a wide range of demand for phosphate fertilizers. Special compound fertilizers with various nutrient combination formulas are produced to meet the demand of special soil (region) and special crop. Thus, the individuality makes fertilization more scientific and more economical as well.

2.4 Depending on Mostly Domestic Raw Material Resources

- **Phosphate rock:** China is rich in phosphate rock resources, which is sufficient for phosphate fertilizer supply. In 2002, a total of 23.01 Mt (P_2O_5 30%) phosphate rock was produced, not only meeting domestic demand, but also for exports (at about 3.51 Mt.)
- **Sulfuric acid:** Annual output of sulfuric acid increased from 14.07 Mt to 30.52 Mt just thru the past ten years, 1992-2002, with an average annual increase rate of 8%. In 2002, there were 0.42 Mt exported and 1.82 Mt imported in addition. Thus, the total supply of sulfuric acid was 31.92 Mt, of which more than two-thirds were consumed in phosphate compound fertilizers production. The raw materials for sulfuric acid consist of pyrites 39.5%, smelter acid 22.7%, sulfur 36.4% and others 1.4%. Very few sulfur was imported before 1995, but it has increased dramatically since 1996. In 1995, only 0.19 Mt was imported. In 2002, imports reached 4.10 Mt, accounting for 19% of world total exports. In the first six months (Jan.-June) of 2003, output of sulfuric acid was 15.86 Mt, imported sulfur was 2.39 Mt, and imported sulfuric acid 0.97Mt. The estimated output of sulfuric acid in 2003 would be 33 Mt.

- **Ammonia:** In 2002, 36.54 Mt of ammonia (NH₃) was produced domestically. A portion of it was provided as raw material for phosphate compound fertilizers production. As a complement, a small amount of imported ammonia will be needed from now on.
- **Potash:** China lacks potash resources, as around 88% of its needs are imported now. In 2002, domestic output was: potassium chloride at 0.85 Mt product and potassium sulfate at 0.6 Mt only. Meanwhile the volume of imported potassium chloride was 6.65 Mt, and potassium sulfate 0.30 Mt. In the first six months of 2003, the volume of imported potassium chloride was 3.6 Mt, and imported potassium sulfate 0.21 Mt. The same situation will keep on in the future.

2.5 Strong Competitive Ability of China's High-Analysis Phosphate Compound Fertilizers in Global Market

China joined the World Trade Organization (WTO) in December 2001. China committed to establish import tariff quotas for DAP, Urea and NPK compound fertilizers during the period of 2001-2006. Since then, import of DAP has increased dramatically, from 3.29 Mt (product) in 2001 to over 4.93 Mt in 2002 – an increase of 50%. Import of NPK compound fertilizers rose from 2.26 Mt to 2.82 Mt – an increase of 25%. While the domestic DAP production also increased from 2.09 Mt to 2.67 Mt – an increase of 28%. Consequently, the total supply of DAP in the Chinese market reached 7.6 Mt abruptly in 2002. However, the current demand for DAP in Chinese market has kept around 5.5 to 6.0 Mt all along, the excessive imports caused a great amount of inventory.

As a rule, when supply surpassed demand, a decline in price followed. So, market prices fell down all over the imported DAP fertilizer wholesale price, the retail-price and the domestic fertilizer producer's ex-factory price. Finally, it damaged interests of all three parties: foreign enterprises, distribution commercial firms and domestic production factories, who were involved. Obviously, the fact of last year pointed out that keeping commitment on the tariff quota is not equivalent to the necessity of importing as much quantity of fertilizers as the quota set. The final decision for the imported amount should be made by the market demand as well as the competitive ability of each one in Chinese market. It was also fully proven by the fact that in the first six months of 2003, the amount of imported DAP decreased to 1.42 Mt, and imported NPK decreased to 0.95 Mt. Then, the market appeared near an equilibrium between supply and demand.

As for the competitive ability of Chinese phosphate compound fertilizers in the world market, the cost of production in most factories has been as low as the cost of C.I.F. now. It was achieved by means of technology modernization and management upgrading. Besides, services in the area of agricultural chemistry have been improved and strengthened with great effort, such as producing special fertilizers with special nutrient combination for farmers; making suggestions to help carry out scientific and economical fertilization. These services have been widely welcomed by farmers. In 2002, even under soft market situations, both the production and sales of domestically-produced DAP were increased by 25% over the previous year. Such increasing trend was still prevailing in the first six months of 2003, showing the strong competitive ability and great vitality of China's phosphate compound fertilizers.

3. OUTLOOK FOR CHINA'S PHOSPHATE FERTILIZER INDUSTRY

3.1 Production of Phosphate Fertilizer over 9 Mt P₂O₅ by 2005

In the "Tenth Five Year Plan" (2001-2005), the estimated total phosphate fertilizers demand in China will be 10.5-11.5 Mt P₂O₅ by 2005 and 11.5-12.0 Mt P₂O₅ by 2015. Domestic phosphate fertilizer output as planned will increase to 8.0- 9.0 Mt P₂O₅ by 2005 and to 10.0-11.0 Mt by 2015. The balance will be supplied by imports. But, since compiling the "Tenth Five Year Plan", something new happened in the past two years. Primary, for a long time, the oversupply situation and lower prices of crops have deeply damaged farmers who are engaging in planting. Hence, their spirit of progress has been heavily depressed by low profit they gained. Secondary, import of agricultural products has increased since we joined the WTO. As a counter-measure, the authorities have reduced the area under crop year after year since 1999. Besides, the Chinese government takes active measures to preserve the environment by returning the land under crop to forest, grassland and lake in certain regions.

All of these directly affected domestic demand for fertilizers. Therefore, in the past several years, China's apparent phosphate consumption has been maintained at the level of more than 9 Mt P₂O₅. And there isn't any sign of further increase in the near future. However, domestic phosphate fertilizer production as estimated will be still over 9 Mt P₂O₅ by 2005 and it is expected to meet 90% of the demand. The estimated domestic sulfuric acid production by 2005 will be over 35 Mt, of which around 40% will possibly be based on sulfur as raw material, if imported sulfur keeps a reasonable price.

3.2 High-Analysis Phosphate Compound Fertilizer Making Up 55% of the Total By 2005

In "Tenth Five Year Plan", by 2005 there will be an additional 1.5-2.5 Mt (P₂O₅) of phosphate fertilizers production. The growth lies primarily in high-analysis phosphate compound fertilizers including MAP, DAP and NPK, which altogether will account for a 55% share of the total phosphate fertilizers production.

The production of low-analysis phosphate fertilizer products (SSP and FMP) will still account for 45% of the total by 2005. SSP contains low phosphorus. Nevertheless, it contains many other essential nutrients: calcium, sulfur etc. Moreover, it provides a set of advantages: low market price, suitable for various soils and crops, using low to middle quality domestic phosphate rock resources and consuming less sulfuric acid. Therefore, production of SSP is in line with the strategy of sustainable development.

Similarly, the price of FMP is low and FMP contains multiple nutrients like calcium, magnesium and silicon. Its production can also use low to medium-quality domestic phosphate rock resources even without sulfuric acid. Both SSP and FMP can complement the shortage of secondary nutrient elements like calcium, magnesium, and sulfur in high-analysis phosphate compound fertilizers. Hence, SSP and FMP are still good and economical fertilizers for farmers, especially for the farms located not far away from sales centers. It is estimated that the production of SSP and FMP will be reduced to some degree, but they will remain in the Chinese market for a long period.

3.3 Establishment of 3 Mt P₂O₅ Additional Capacity in the Coming Five Years

There are projects to bring new additional capacity of close to 3 Mt P₂O₅ in the coming five years in order to meet over 90% of the domestic market demand.

In order to greatly reduce the investment of new established capacity and cost of production, the development of China's phosphate fertilizer industry will depend on the full utilization of its current industry facilities, no additional grassroots factories, as well as mainly using domestic technologies, designs and equipments during the period of the "Tenth Five Year Plan".

For that reason, a plan for the rational distribution of industry will be carried out. Major developments will center in regions that are rich in phosphate rock resources, like Yunnan and Guizhou Provinces.

On the contrary, there will be little developments in regions short in resources. A group of small plants with out-of-date technology, obsolete management and low efficiency will be closed. While those plants, which are most productive in potential, will be upgraded and modernized. From now on, no matter what kind of facility (new established or modernized), investment will be based on the credible fact. This is to ensure a certain profit of the enterprise whenever the market price of products drops down to the historical lowest levels.

The overall strategy for developing the phosphate fertilizers industry will continuously focus on improving economic efficiency to upgrade the whole competitive ability of China's phosphate compound fertilizers in the global market.

To achieve this goal, some important measures will be taken as following: modernizing technologies, elaborating potential capacities and strengthening management to reduce production cost; adjusting production structure and increase their consolidation to generate collective advantages; and accelerating the modernization of commodities circulation to reduce the cost of transportation, storage and marketing.