

Outlook for World Fertilizer Demand, Supply, and Supply/Demand Balance

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Received: 27.03.2008

Abstract: The outlook is driven by impressive economic growth in Asia, increasing demand for biofuel, and a tight grain market. As a result of tight supply/demand conditions, prices for almost all agricultural commodities are unusually high. The need to boost agricultural production worldwide is stimulating fertilizer consumption in Asia and the Americas, driving global demand to new record levels. For the production of most nutrients 2007 was a record year, as buoyant demand stretched the industry's capacity to meet global requirements. All supply and demand situations will be difficult to balance until 2011 due to sustained fertilizer demand. With nitrogen supply growing at a much faster rate than demand in the medium term, a significant urea surplus is likely until 2010. Other nutrient balances will be tight until 2011.

Key Words: Agricultural production, fertilizer demand, fertilizer supply

Global Context

Despite surging oil prices and an economic slowdown in the United States, the world economy remains robust. Reflecting continued rapid growth in emerging Asia, world gross domestic product (GDP) in 2007 will increase by some 5% for the fourth consecutive year according to the International Monetary Fund (IMF, 2007).

Weather conditions in 2007 were favorable overall, although Europe, the Black Sea region, Morocco, and Australia were affected by dry spells (FAO, 2007).

Policy leaders in Brazil, the United States, and the European Union (EU) have provided strong support for biofuel production (Coyle, 2007). The expansion of maize-based bioethanol production has been particularly rapid in the United States. The bioethanol boom has resulted in a dramatic crop mix change in the US, with a 20% increase in the area planted to maize in 2007 (USDA, 2007). In response to rising demand for feedstock from the biofuel industry, the area planted to sugar cane in Brazil and to rapeseed in the EU is also increasing quickly. This trend is expected to slow down in 2008 due to high feedstock (maize and rapeseed) prices, which make biofuel production less profitable.

The Doha Round of trade negotiations and negotiations on the accession of Russia to the World Trade Organization (WTO) are not expected to have direct impacts in 2008; however, the stagnation of the Doha Round could result in the postponement of national agricultural policy reforms, or in less ambitious reforms. It is against this background that policy makers are discussing the proposed new US Farm Bill and the mid-term "health check" of the EU Common Agricultural Policy. At this stage it is premature to anticipate the content of reforms or when they would come into effect. In the context of the current tight grain market, the European Commission has decided to discontinue the 10% mandatory set-aside in 2008, which could potentially result in a 1.5 to 2.0 million hectare increase in the EU cropped area.

On the environmental side, reactive nitrogen (N) remains the main issue. Discussions focus on its loss to the atmosphere and the hydrosphere, but increasing attention is also being paid to the impact of the lack of reactive N. In response to societal demands, N use efficiency has been improving in developed countries for more than 2 decades. While it has not improved in most developing countries, such an improvement could be observed in China towards the beginning of the next decade.

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Agricultural Situation

Market conditions for agricultural commodities improved in the second half of 2006, and have been exceptionally favorable since the first half of 2007. With 4.1% year-on-year growth in 2007, world cereal output is projected to reach a new record level of over 2.1 billion tonnes according to the Food and Agriculture Organization of the United Nations (FAO) (Figure 1).

The increase in coarse grain production in general (+7.4%), and the increase in maize production in the United States in particular (+25%), account for most of the 80-Mt increase in world cereal output. The wheat harvest would only partly recover (+1.2%) from the 4.6% reduction observed the previous year, and the global rice crop is stable for the second consecutive year.

At the same time, global cereal demand is booming, with average annual growth since 2002 that is almost double historical growth rates. This trend is essentially driven by strong demand from the bioethanol and meat sectors, responding to economic growth in developing countries and high crude oil prices. As a result, the United States Department of Agriculture (USDA) forecasts a 17-Mt reduction in world cereal inventories and the aggregate stock-to-use ratio dropping to a low of 15%. This would be the lowest level registered for more than 2 decades, corresponding to 54 days of consumption. The stock-to-use ratio for coarse grains is forecast at only 12.8% (USDA, 2007). Consequently, international wheat, maize, and rice prices are high.

Because of the strong competition from cereals, the 2007 soybean and cotton harvests are down, and ending stocks for both crops are declining. In this unusual context of competition for land, oilseed futures are soaring to ensure adequate oilseed crop plantings for the 2008 harvest (USDA, 2007). This very positive outlook for agricultural commodities is not expected to change in the medium term (FAPRI, 2007).

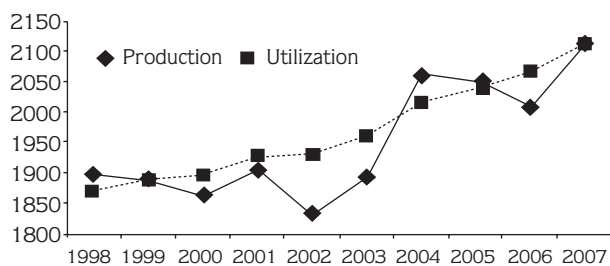


Figure 1. World cereal production and consumption (Mt) (FAO, 2007).

Plantings and the emergence of winter crops in the northern hemisphere have occurred under relatively favorable conditions, offering good preliminary prospects for the 2008 harvest. The global area planted to winter wheat has significantly increased from the previous year (IGC, 2007). In the United States it is anticipated that farmers will temporarily shift from maize to soybean for their 2008 spring plantings.

Global Fertilizer Demand

After a modest 1.5% growth in 2005/06, aggregate world fertilizer consumption sharply increased (+5.0%) in 2006/07, to 163.9 Mt of nutrients. Contrary to the medium-term trend, consumption of N fertilizers increased more rapidly (+5.4%) than that of P (+5.1%) and K (+3.5%) products (Table). By region, demand recovered strongly in North America (+9.9%) and West Asia (+8.1%) after declines during the previous campaign. More moderate but still strong growth in consumption is seen in South Asia (+5.7%), Eastern Europe and Central Asia (+5.5%), Africa (+5.2%), East Asia (+5.0%), and Latin America (+4.6%). Consumption declined significantly in Oceania (-5.3%), and modestly in Western and Central Europe (-0.8%). East Asia and North America together are estimated to account for two-thirds of the increase in world fertilizer consumption in 2006/07. If South Asia were added, the 3 regions together would account for 84% of growth (Heffer, 2007b).

In response to strong market fundamentals, world demand is expected to further expand in 2007/08. Global demand would reach 170.3 Mt of nutrients, corresponding to a 3.9% year-on-year increase. Demand for K fertilizers is anticipated to sharply rebound

Table. Global fertilizer consumption (Heffer, 2007b).

	N	P ₂ O ₅	K ₂ O	Total
	Mt nutrients			
2005/06	93.2	37.1	25.8	156.1
2006/07 (e)	98.2	39.0	26.7	163.9
Change	+5.4%	+5.1%	+3.5%	+5.0%
2007/08 (f)	100.8	40.5	29.0	170.3
Change	+2.7%	+3.8%	+8.4%	+3.9%
2008/09 (f)	103.6	41.8	30.4	175.8
Change	+2.7%	+3.3%	+4.9%	+3.2%

(e) estimated; (f) forecast

(+8.4%) after relatively modest growth, compared to N and P, in 2006/07. Demand for P fertilizers would remain firm (+3.8%) while demand for and growth of N products would slow (+2.7%) (Table). In this overall positive context, fertilizer consumption is anticipated to increase in all regions, except Oceania (-3.1%), West Asia (-2.6%), and North America (-0.8%). The strongest relative increase in demand is forecast for Latin America (+11.5%), followed by South Asia (+6.6%) and East Asia (+4.1%). Demand would rise by 1%-3% in all other regions (Heffer, 2007b).

The global agricultural context is projected to remain favorable in 2008/09. As a result, the upward trend in world fertilizer demand would continue. Projections to 2008/09 point to an expansion (+3.2%) of global demand, which would reach 175.8 Mt. Similarly to the previous year, growth would be stronger for K fertilizers (+4.9%) than for P (+3.3%) and N (+2.7%) products (Table). Between 2006/07 and 2008/09, it is anticipated that 89% of the increase in world fertilizer consumption would come from East Asia, South Asia, and Latin America together (Figure 2).

Medium-term forecasts to 2011/12 point to a 2.6% average annual growth rate compared to the average of the 2004/05 to 2006/07 period. Demand for K fertilizers would increase faster (+3.2% per annum) compared to P (+2.9% p.a.) and N (+2.3% p.a.). Aggregate fertilizer demand is seen reaching almost 185 Mt of nutrients in 2011/12, with some 108 Mt of N, 45 Mt of P_2O_5 , and 32 Mt of K_2O . East Asia, South Asia, and Latin America together would account for some 85% of the increase in demand (Heffer, 2007a).

Global Fertilizer Supply

Nitrogen

Nitrogen supply/demand conditions in 2007 remained very tight, driven by strong nitrogen fertilizer consumption worldwide, particularly in the main consuming countries. Production outages in exporting countries and delays in the commissioning of new capacity further tightened supply availability, as most producers operated at close to capacity.

World ammonia production in 2007 increased by 3.8%, reaching 153.6 Mt of NH_3 . China contributed half of the net increase. Other significant increases occurred in Saudi Arabia, the United States, Egypt, Iran, Australia, and the United Kingdom. World ammonia trade in 2007 grew by 1% over 2006, to 19.6 Mt of NH_3 . The main increases in exports came from Saudi Arabia, Australia, and Iran. The main import growth destinations were the United States and northeast Asia.

In 2007, world ammonia capacity was estimated at 176.6 Mt of NH_3 , expanding by 2.6% over 2006. The main additions to capacity came from China, Egypt, and Iran. The world nitrogen/ammonia supply/demand balance was reduced in 2007, but the surplus in 2008 will expand by one-third as a result of new capacity (Figure 3). The growth of the potential surplus will accelerate from 2009, as new large plants come online (Prud'homme, 2007b). According to the IFA 2007 world capacity survey, global ammonia capacity will increase to 205 Mt of NH_3 in 2011. The bulk of the capacity growth will occur in East Asia, West Asia, Eastern Europe and Central Asia (EECA), Africa, and South Asia.

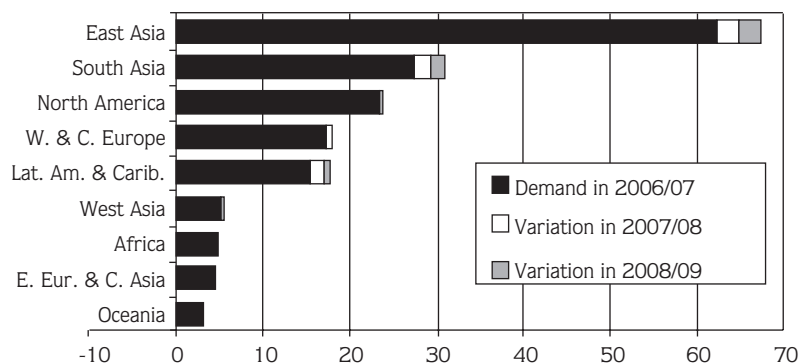


Figure 2. Projected evolution of regional fertilizer demand between 2006/07 and 2008/09 (Mt of nutrients) (Heffer, 2007b).

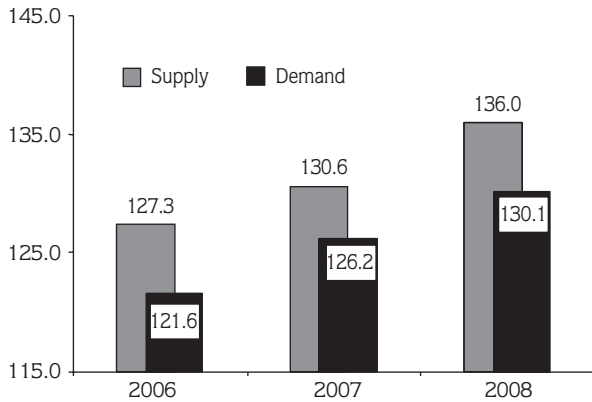


Figure 3. World nitrogen supply/demand balance for 2006-2008 (Prud'homme, 2007b).

Global urea production in 2007 was forecast at 143.1 Mt of product, representing a 6% increase over 2006. The main production expansions occurred in China, Egypt, and Saudi Arabia.

Global urea trade was very robust, growing by 12% to 35.1 Mt. It has been driven by sustained requirements from large consumers such as India, West Europe, and the United States. China emerged as one of the world's largest urea exporters, with exports exceeding 5 Mt.

Close to 4.5 Mt of new urea capacity was commissioned in 2007, mostly in China, Egypt, and Iran. Global urea capacity is projected to further increase in 2008 to 165.7 Mt, with China accounting for one-half of the increase. The world urea supply/demand balance in 2007 showed tight market conditions, with the industry operating close to effective capacity (Figure 4). The global urea market may remain tight in the first half of 2008, with firm import demand into North America, West

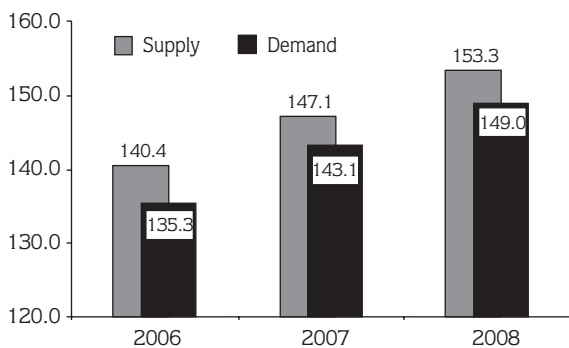


Figure 4. World urea supply/demand balance for 2006-2008 (Prud'homme, 2007b).

Europe, South Asia, and Latin America. India will be the main driver of import demand. China will likely remain in a strong net exporting position in 2008 (Prud'homme, 2007b).

World urea capacity is forecast to grow to some 192 Mt of urea in 2011. West Asia and East Asia will contribute two-thirds of the overall capacity expansion. The other main sources of new capacity are Africa and South Asia. A growing surplus will emerge in 2009, with the potential to reach some 15 Mt in 2011. By 2011, the surplus could be equal to 8% of global capacity, assuming that all announced projects proceed as planned (Prud'homme, 2007a).

Phosphate

World demand for phosphate fertilizers in 2007 grew by 3.8%, pressuring the industry to operate at high capacity during the entire year. Production of raw materials, intermediates, and processed phosphate fertilizers rose to near record levels, while input costs continued to expand, notably in the case of sulfur and ammonia.

World production of phosphate rock rose by 2.7% to 172.1 Mt, of which China contributed one-third. Global trade of phosphate rock increased by 6% during 2007, after registering 2 years of decline; strong deliveries were reported into Europe, North America, and Latin America.

The supply of phosphoric acid was tight on account of strong domestic demand, as international trade remained static due to lower sales to India. World phosphoric acid capacity in 2007 decreased to 43.2 Mt, but will rebound to 45 Mt of P₂O₅ in 2008 with new projects in China and Morocco. World phosphoric acid supply/demand showed a marginal surplus in 2007, which led to tight supply conditions (Figure 5). In 2008, growth in demand will match that in supply, keeping the current balance tight (Prud'homme, 2007b).

Global phosphoric acid capacity is forecast to reach 49.6 Mt of P₂O₅ in 2011. The main additional capacity would occur in China and Saudi Arabia. The overall phosphoric acid supply/demand situation is anticipated to remain very tight until 2010, with a marginal surplus equaling less than 2% of global supply. The surplus could expand in 2011 and reach some 4% of global supply (Prud'homme, 2007a).

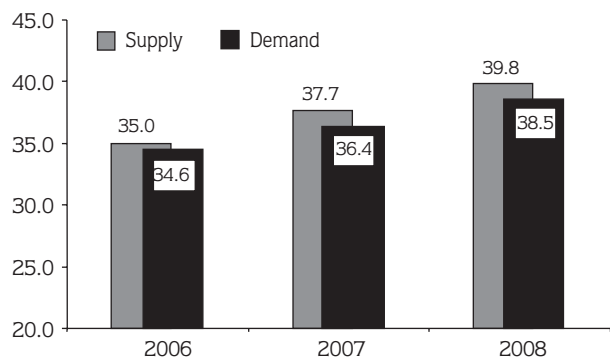


Figure 5. World phosphoric acid supply/demand balance for 2006–2008 (Prud'homme, 2007b).

In 2007, world production of processed phosphates (MAP, DAP, and TSP) grew by 5% over the previous year to 25.2 Mt of P₂O₅. The global trade of MAP and DAP in 2007 rose moderately to 8.4 Mt of P₂O₅. A decrease in DAP volume was more than offset by an increase in MAP exports.

In 2006 and 2007, global phosphate fertilizer capacity barely expanded. Global processed phosphates capacity in 2008 is projected to be 33.6 Mt of P₂O₅. New DAP-MAP capacity is projected to come online in China, Bangladesh, Pakistan, and Vietnam. In 2008, the global processed phosphates market is projected to continue to grow. Import demand for processed phosphates is forecast to increase in Latin America, South Asia, and West Asia, and to decline further in China. New DAP-MAP exportable tonnage is anticipated in China and Morocco (Prud'homme, 2007a).

Potash

World potash market conditions were very tight in 2007 due to stronger than anticipated demand for potassium nutrients. A surge in import demand stretched

producers' ability to supply potash to a widening base of customers. Global potash production was estimated at 55.7 Mt of MOP equivalent, a 15% increase over 2006. Potash deliveries in 2007 reached 55.7 Mt of MOP, and global potash exports were estimated to be 44.6 Mt of MOP, a 16% growth over the previous year.

There were important additions to capacity in 2007, mostly in Canada and China, but these remained at a ramp-up stage during the year; thus production was limited to existing capacity. Production capacity additions in 2008 will be relatively marginal. World potash supply/demand balances for the period from 2006 to 2008 showed a rapid reduction of the prevailing surplus, of which some remains in the form of non-readily available capacity in Canada. As a consequence, overall market conditions in 2008 are expected to remain tight (Figure 6).

The global supply/demand balance is expected to tighten until 2009. Starting in 2010, the addition of new capacity would reverse the declining surplus trend (Prud'homme, 2007a).

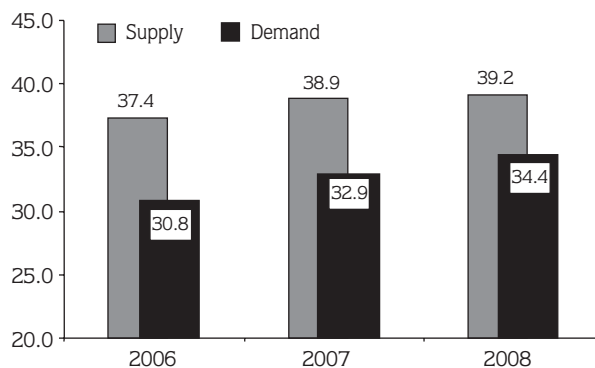


Figure 6. World potash supply/demand balance for 2006-2008 (Prud'homme, 2007b).

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