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Fertilizer Supply/Demand Outlook to 2000

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The outlook for fertilizers suggests supply/demand conditions will stay relatively tight over most of the forecast period. World fertilizer consumption, which fell steadily in recent years, now appears to be increasing and is expected to continue to rise through 2000. On the supply side, new fertilizer-production capacity is expected to be added in response to recent increases in fertilizer prices. However, because of the time required to build new facilities, production-capacity is unlikely to increase significantly till late in the forecast period.

Market Overview: Where We’ve Been

The world fertilizer market has tightened substantially over the past two years. Consider the price of ammonia. Wholesale ammonia prices (basis U.S. Gulf) hit a low of $88/ton in August 1993, then began rising steadily reaching $200/ton by fall 1994 and almost $260/ton in March 1995. Because of last spring’s low corn plantings and poor application season, prices have fallen-back recently and are now approximately $180/ton.

What happened to cause the dramatic increase in price? One of the primary factors was the change-over in economic systems in the Former Soviet Union coupled with the U.S.’s increasing reliance on ammonia imports.

U.S. dependence on imported ammonia has grown substantially as the gap between domestic production and consumption has widened. Demand has been rising as use of “upgraded” fertilizers (urea, urea-ammonium nitrate solutions, diammonium phosphate, etc.), which use ammonia as an input, has risen. Industrial demand has also been strong. Production, however, has increased less due largely to the lingering effects of the depressed prices/weak profit margins that dominated the industry for most of the past decade, and which forced producers to shut-in some production facilities. U.S. imports of ammonia jumped more than 40% in the past two years.

The U.S. is the world’s largest single importer of ammonia. On the other side, the largest exporter is the Former Soviet Union, accounting for more than 35% of total world ammonia exports. The political and economic convulsions experienced in the FSU in recent years have had a dramatic impact on the world nitrogen market.

FSU production costs for ammonia have risen sharply. The reason: higher prices for natural gas, which accounts for approximately 80% of ammonia production costs. For years natural gas prices were held at artificially low levels in the FSU—only a fraction of world price levels. Russia began to allow natural gas prices to rise in early 1992, particularly for gas sold to non-
Russian producers. Prices to Ukrainian producers were as low as $0.05/MMBTU prior to the breakup of the FSU, but increased to about $1.85/MMBTU in 1994 and are now reportedly near $2.60/MMBTU. Prices in Russia are lower at around $0.75/MMBTU, but are still many times price levels under the old communist regime.

Given the prominent role the FSU plays in world nitrogen trade, the rise in production costs pushed world ammonia prices higher. That, in turn, rippled through to the U.S. market, tightening the U.S. supply/demand balance and pushing prices higher for other nitrogen fertilizers as well.

Another factor which has played a central role in supporting fertilizer prices is the recent turnaround in world fertilizer demand. World fertilizer consumption was on a steady decline from 1988 through 1994, dropping 18% over this period. The culprit: severe cutbacks in fertilizer use in the FSU and eastern Europe; N-P-K consumption over this period fell more than two-thirds in eastern Europe and more than 85% in the FSU. Consumption also declined in western Europe because of reduced farm support prices.

The sharp declines in consumption masked on-going increases in fertilizer use in other parts of the world, particularly in Asia and Latin America. Now, consumption appears to be stabilizing in eastern Europe and the former Soviet Union. And with continuing increases in other regions, world N-P-K consumption is expected to increase 2-3% in calendar year 1995—the first increase in 7 years.

Rising international demand, particularly in China, has been a key factor behind the increase in prices for phosphate fertilizers over the past year or so. China’s consumption of phosphate fertilizers rose to a new record-high in calendar year 1994 and is expected to increase an additional 10% or so this year. As it consumption has risen so too has its need for phosphate imports. This, in turn, has fueled a strong increase in U.S. phosphate exports.

Unlike nitrogen, the U.S. is a large exporter of phosphates. In fact, it is the world’s largest exporter of phosphate fertilizers, accounting for approximately two-thirds of world DAP exports. Moreover, exports are vital to the U.S. phosphate industry accounting for almost 65% of total disposition of U.S. DAP in recent years.

U.S. exports to China exploded in fertilizer year 1994/95, rising nearly 60% above the year-earlier level. Total U.S. DAP exports rose 24% from 1993/94 and were 13% above the previous high. Strong export demand caused total disposition of U.S. phosphates to rise to a new record in spite of relatively weak demand here at home. Prices for DAP (basis Central Florida) increased almost 30% on average above 1993/94.

Strong international demand has also been a major factor in potash markets. Potash exports from Canada, the world’s dominant exporter, jumped 17% in 1994/95 in spite of relatively flat exports to the U.S. (Imports from Canada generally account for about two-thirds of U.S. potash supply.) As with phosphates, China was the main reason for strong international demand as its imports of potash hit a new record-high. In spite of rising exports, however, the Canadian potash industry
continued to be dominated by excess capacity; potash prices as a result have been relatively unchanged over the past couple of years in sharp contrast to nitrogen and phosphate.

**Outlook: Where We’re Headed**

The outlook suggests world demand for plant nutrients will continue to trend higher through 2000. Planted acreage both within the U.S. and worldwide is expected to be relatively high. Application rates outside the U.S. are also expected to rise modestly.

**Agricultural Outlook: Demand Expected to be Strong**

The outlook is relatively bright for U.S. and world agriculture in the years ahead. Most forecasters agree that world grain consumption will be increasing, led by rising demand in fast-growing developing nations, particularly in Asia.

Grain consumption is rising as economic prospects improve in numerous developing nations. Again, China provides the best example of this. China’s economy is growing at rates that are among the highest in the world. Gross domestic product has risen at an average of over 13% per annum in recent years according to the International Monetary Fund. In turn, rising incomes are prompting Chinese consumers to demand diets based more on meat and poultry. USDA data indicate China’s production of beef is now more than twice its 1990 production; poultry production is 3 times 1990; and pork production is 1.5 times the level of 5 years ago.

All of this is promoting rapid increases in grain demand, which has in turn caused China’s demand for grain imports to surge. (It’s also caused fertilizer imports to rise dramatically as noted above.) Coarse grain used in livestock feed has increased at an annual average rate of nearly 8% since 1990 according to USDA. China’s imports of grain (including wheat and coarse grains) nearly tripled last year, and its trade status switched from large net exporter to large net importer: in 1993 its net exports of grain totaled approximately 7 million metric tons; in 1994, it was net importer of over 14 million metric tons. Its imports are expected to rise further this year.

China’s changes have been dramatic and have caused substantial increases in world grain trade and U.S. grain exports. Changes in many developing countries are not expected to be as dramatic, but most are expected to increase grain use in the years ahead as their consumers seek to improve their diets. World grain consumption is projected to rise approximately 2% annually. World grain trade and U.S. exports are also expected to rise.

With consumption trending higher, crop acreage will likely be relatively high through 2000. U.S. corn acreage, which fell to 71.3 million acres last spring, is projected to rise to over 80 million acres in 1996 and fluctuate around 78-80 million acres through 2000. Acres planted to wheat and soybeans are expected to grow moderately. Foreign crop acreage is also expected to be relatively high as nations around the globe try to boost crop production to meet food needs. Acreage levels are projected to be strong in spite of the expectation that yields will continue to rise at rates consistent with the increases of the past 15-20 years.
It should also be noted that the outlook for U.S. crop acreage is largely independent of the outcome of the 1995 Farm Bill debate. If demand continues to rise moderately as projected, whatever the final outcome of that debate, there is expected to be little or no acreage idled under annual acreage reduction programs in the future.

Another factor that will cause acreage to increase in the short term is that inventories of grain are extremely tight. USDA projects world and U.S. grain inventories will finish the current marketing year at their lowest levels in 20 years.

It appears most forecasts for U.S. agriculture take a largely similar view. The Food and Agricultural Policy Research Institute of Iowa State University and the University of Missouri, the U.S. Feed Grains Council, and The WEFA Group, a private economic consulting concern, all forecast increases in grain demand, rising U.S. exports, and relatively high crop acreage through 2000.

The WEFA Group summarizes the outlook this way:

The world economic environment is more favorable than it has been at any time during the last 15 to 20 years. In almost every region of the world, economic growth is rising. This is especially true in east Asia, where overall growth is expected to exceed 7% for at least the next 5 years. In China the growth rate is expected to average nearly 10% per year over the next 5 years. While less robust, strong growth is also expected in Latin America and the Middle East. In the rest of the developing world, especially in Africa and southeast Asia, economic growth will be modest while population growth is high. However, even in these poorer regions, economic growth during the next 5 years is expected to be stronger than it was during the most recent 5 years. Stronger economic growth will allow for higher food demand and an improving ability to buy food in world markets.

Fertilizer Consumption to Rise

Because of the relatively bright outlook for agriculture, world consumption of fertilizers is expected to increase moderately in the years ahead. World consumption is expected to increase in calendar year 1995 for the first time since 1988, as mentioned above. Consumption is expected to continue to increase steadily thereafter. Aside from higher acreage, improved incomes should allow developing countries to boost fertilizer application rates to increase crop productivity. Again, Asia is expected to be the driving factor. Increases are also forecast for Latin America. Consumption in the former Soviet Union, meanwhile, is expected to increase marginally at best. In total, world fertilizer consumption is projected to rise 2-3% annually to near 140 million nutrient tons in 2000.

In the U.S., fertilizer consumption is also expected to be relatively strong. However, it is expected to rise slower than world demand. After falling sharply last year, nitrogen consumption is forecast to rebound in fertilizer year 1995/96 to 12.2 million tons N, a projected increase of 7% above the estimated level for 1994/95. (If correct, 1995/96 would be the second highest level for
nitrogen fertilizer use ever.) Phosphate and potash consumption are also projected to rise 6-7% this year. Thereafter, consumption of all three primary nutrients is projected to rise about 0.5% annually through 2000.

Virtually all of the increase projected for U.S. fertilizer consumption, especially after 1995/96, is expected to come from higher acreage; application rates for all three nutrients are assumed to be relatively flat.

**Outlook for Nitrogen Fertilizers: How Much New Capacity and When?**

The nitrogen supply/demand situation in the U.S. will continue to be dominated by the following factors:

- Reliance on imports to satisfy a significant portion of U.S. needs.
- Little expected increase in world nitrogen production capacity at least through 1997.
- A relatively tight world supply/demand balance for the next 2-3 years.

With demand for nitrogen fertilizer in the U.S. projected to be relatively strong, imports will continue to represent an important component of U.S. nitrogen supply. Ammonia imports are expected to represent near 20% of U.S. ammonia supplies in the years ahead; urea imports are projected to represent 20-25% of urea supplies. As such, supply/demand conditions in the U.S. will continue to be directly tied to world supply/demand conditions for nitrogen fertilizers.

Meanwhile, world nitrogen production capacity is projected to be relatively flat for the next couple of years. New plant capacity is expected to come on-stream in China and other parts of Asia. U.S. capacity is also expected to rise moderately due to on-going plant debottlenecking projects. But older inefficient plants are expected to continue to close in the former Soviet Union and eastern Europe. As such, with rising world demand, the capacity utilization rate for the world nitrogen industry for calendar 1996 is expected to climb to its highest level in several years, and is expected to remain high in 1997.

The question for the longer term is ‘How much new capacity will be added and when will it come on stream?’ New “grass roots” production facilities take some 3 years to build. It is almost certain that the recent strength in prices for nitrogen fertilizers will prompt the building of new facilities. Reportedly, there are numerous producers around the world, including North America, who are looking at building new capacity.

Making assumptions on various potential projects, the most likely scenario may be that world nitrogen capacity will increase some 4-5% in calendar year 1998, and 2-3% thereafter through 2000. Under this scenario, the world supply/demand balance will likely ease somewhat with capacity utilization falling modestly after 1997. Gauging the impact the recent increase in prices will have on future capacity is difficult, however, and it is possible other, additional projects will come on-stream toward the latter part of the forecast period.
Phosphate Outlook: Export Strength Key

Like nitrogen, the U.S. supply/demand outlook for phosphate fertilizers is also tied directly to the world market. The difference is that, rather than being an importer as in the case of nitrogen, the U.S. industry is vitally dependent on phosphate exports.

The demand for U.S. phosphate exports is expected to be strong in the years ahead. The need for phosphate imports is expected to continue to be strong in China, in spite of expected increases in China’s phosphate production capacity. India, the U.S. industry’s second largest foreign buyer, is also expected to boost its imports through 2000, and import needs are likely to increase in other developing nations.

The outlook suggests world phosphate production capacity will increase at only a modest rate in the years ahead. New capacity for phosphoric acid (the basic input for most phosphate fertilizers) is expected to come on stream in the Middle East. Existing U.S. plants are also expected to be expanded modestly. Large production projects in Morocco, the U.S.’s chief export competitor, and in Saudi Arabia are not expected to come on stream till after 2000, however. As such, with demand expected to rise moderately, the world phosphate supply/demand balance is expected to tighten toward 2000.

As was the case with nitrogen, however, it should be noted that current relatively high phosphate prices may intensify efforts to build additional production capacity, which could in turn ease the supply/demand situation toward the latter part of the forecast period.

Potash Outlook: Excess Capacity Declines

The situation for potash differs somewhat from that for nitrogen and phosphate. Potash markets at present continue to be dominated by excess capacity. However, with world consumption expected to rise 2-3% annually in the years ahead, excess capacity is likely to decline somewhat. Capacity utilization for North America, which is dominated by Canada, is expected to edge higher as export demand continues to rise and North American use grows modestly. However, capacity utilization is expected to remain below 80% throughout the forecast period.

Summary

Fertilizer markets have undergone dramatic and fundamental changes in the past 1-2 years, especially for nitrogen and phosphate fertilizers. The outlook suggests world demand for fertilizers will grow modestly in the years ahead because of increases in planted acreage and higher application rates. In the U.S., demand for fertilizers is expected to rebound in fertilizer year 1995/96, then rise modestly thereafter as acreage is expected to be strong; U.S. application rates are expected to be relatively flat, however. Fertilizer capacity is more speculative. It appears little new nitrogen or phosphate capacity will be added in the next couple of years. As such, the world supply/demand balance is expected to remain tight. Thereafter, new nitrogen capacity may come on stream, which would help ease the supply/demand balance. However, predicting how much new capacity will be added or its
timing is speculative at this point. For phosphates, major new production facilities appear to be unlikely to start before 2000, but efforts to build new capacity could intensify in light of recent increases in phosphate prices.

Finally for potash, excess production capacity is projected to decline modestly toward 2000 as demand trends higher.

References


U.S. AMMONIA
PRODUCTION & USE

000 Product Tons

Industrial/Other

Upgrade

Direct Application

Production

Est Fct
WORLD FERTILIZER CONSUMPTION

Million Nutrient Tonnes

160 140 120 100

85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00
WORLD AMMONIA
CAPACITY UTILIZATION

Utilization

Capacity

% Utilization

Production

Million Tonnes

180
150
120
90
60
30
0


90%
80%
70%
60%
50%
NORTH AMERICAN POTASH CAPACITY UTILIZATION

WORLD PHOSPHORIC ACID CAPACITY UTILIZATION

Million Tonnes $P_2O_5$

Capacity

% Utilization

Production

Utilization