The Phosphate Outlook

by

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Outline of Presentation

1. Offshore Demand
   ✓ Fundamentals remain positive in India and Pakistan
   ✓ China becomes self-sufficient
   ✓ Only a modest recovery is expected in South America

2. Domestic Demand
   ✓ Old wives tales and misconceptions
   ✓ How inelastic is nutrient demand?
   ✓ How will high energy prices impact demand?

3. Supply
   ✓ Hurricanes and plant closures reduce U.S. supply
   ✓ DAP and MAP are not the whole story
Offshore Demand
World processed phosphate import demand is projected to stay flat at 21.4 mmt in 2005.

Gains in Asia have offset declines in Latin America this year.

World import demand is forecast to decline next year due to further drops in China, a pull-back in India and just a modest recovery in Brazil.

Processed phosphate includes DAP, MAP and TSP.
The U.S. phosphate industry exported 12 million tonnes of processed phosphate per year during the last half of the 1990s. U.S. exports have dropped to the 9.2 to 9.4 million tonne range since 2000.

U.S. processed phosphate exports are projected to increase about 3% to 9.4 million tonnes in 2005.

U.S. exports required to meet demand are forecast to decline approximately one million tonnes in 2006.
Import demand outside of China increased more than three million tonnes from 16.2 million in 2002 to 19.3 million in 2004.

We estimate that import demand will grow to a record 19.7 million tonnes in 2005.

Increases in India and Pakistan have more than offset the decline in Brazilian imports this year.

Excluding China, import demand in the rest of the world is forecast to decline only slightly in 2006.
China has become self-sufficient in phosphate

China is expected to transition from a small net importer of processed phosphates in 2005 to a small net exporter in 2006.

DAP imports are projected to equal DAP exports in 2006 and exports of MAP and TSP are forecast to remain at current levels.
China’s Phosphate Strategy

At China Chemical Industry Prosperity Period Analysis Forum, official of National Development and Reform Commission said, in the course of Chinese eleventh five-year plan, China chemical industry need to adjust industry design, material and drive structure; to construct a few megaton urea production bases in energy sources, grain and cotton producing areas, phosphate compound fertilizer producing bases in Yunnan and Guizhou, potassium fertilizer producing bases in Qinghai and Xinjiang. The main goals are to supply nitrogenous fertilizer and phosphate fertilizer by ourselves, to raise the rate of potassium fertilizer self-support and to greatly lower the costs of fertilizer producing.

China Fertilizer
BOABC
October 27,2005

Anhui phosphate compound fertilizer plants have suspended operation recently on account of raw material shortage. Thirteen phosphate plants have recently appealed to the central government for a macro-control of phosphorite resources to break regional restriction. Anhui needs 2.6 million MT phosphorite a year, 85% of which relies on inshipment.

China Fertilizer
BOABC
October 27,2005
It is not the strongest of the species that survive, nor the most intelligent; it is the one that is most adaptable to change

Charles Darwin
Theory of Evolution
1859

It is not the oldest or biggest or most revered players in the crop nutrition industry who will survive. Only those who correctly analyze, boldly embrace and quickly adapt to change will survive and prosper.
A pull-back in India from high levels this year

India and Pakistan are projected to import more than 3.5 million tonnes of processed phosphate in 2005.

Continued strong GDP growth and above normal monsoons are propelling phosphate demand and Indian DAP fabrication is off from a year ago and far below plan.

Import demand next year is forecast to decline from the high levels of 2005 due to an expected recovery in Indian DAP fabrication.

Source: IFA and Mosaic

Processed phosphate includes DAP, MAP and TSP
Indian DAP demand is growing steadily as a result strong GDP growth and above-average monsoons during the last few years. DAP use is projected to top 6.5 million tonnes in 2005/06, up 1.1 million tonnes from 5.4 million tonnes in 2002/03.

Use next fertilizer year is forecast to increase another 3% or so to 6.7 million tonnes.

Indian DAP fabrication during the first six months of the fertilizer year (Apr-Sep) was off 21% or nearly 550,000 tonnes from a year earlier and was far below plan.
No snap-back is expected in Brazil

Processed phosphate imports are projected to plunge 40% or 1.4 million tonnes in 2005.

The appreciation of the real, lower soybean prices, higher input costs, lack of credit and a severe drought in southern Brazil have eroded farm economics.

No snap-back is expected in 2006 unless the real depreciates and/or soybean prices rebound.

Processed phosphate imports are forecast to increase about 2% in 2006. MAP imports are projected to increase 200,000 tonnes but TSP imports are expected to decline 175,000 tonnes as a result of new capacity at Fosfertil’s Uberaba complex.
Brazilian MAP imports during the first nine months of 2005 were off 46% or 865,000 tonnes. Imports in August and September were far below the levels of a year earlier.

Brazilian shipments of all fertilizer products were off 28% during the first half of 2005. Shipments in the key months of August and September were off only 5% from a year earlier.
Help from other regions next year

**Latin American Less Brazil Processed Phosphate Import Demand**

- **Source:** Fertecon and Mosaic

**Other Processed Phosphate Import Demand**

- **Source:** Fertecon, IFA and Mosaic

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Import demand in other Latin American markets is projected to climb to record levels led by Argentina, Mexico and several Central American countries.

Imports by “Other” regions also is forecast to increase to record levels led by the Mideast and Africa.
Old Wives Tales and Misconceptions

Farmers spend the same amount on fertilizer each year

Not True
Prices received by farmers and farm income are low

Prior to 1996, the loan rate established a market price floor (P3). At this level, farmers produced Q3 and consumers used Q1. The government (CCC) bought and stored the surplus (Q3-Q1) in order to keep the market price at or near P3.

High loan rates resulted in record government stocks during the mid 1980s and stimulated production in other parts of the world.
Prices received by farmers and farm income are low

Commodity programs today still provide farmers a price floor called the loan rate (P3), but the government no longer buys and stores grain in order to prop up market prices for competitors worldwide.

Instead, the government allows the quantity produced (Q3) to go on the market and lets the market price move to the level required to clear the market (P1 in this case). Then the government pays farmers the difference between their guaranteed minimum price called the loan rate (P3) and the market price (P1). This payment is called the loan deficiency payment or LDP.

This provides farmers a price floor, gets government out of the grain storage business and avoids propping up prices for competitors worldwide. Current loan rates are $1.95 bu for corn and $5.00 bu for soybeans.
Prices received by farmers and farm income are low

USDA estimates that U.S. net cash farm income surged to a record $85.5 billion in 2004 as a result of large crops and relatively strong grain and livestock prices.

Estimates for 2005 released in August show net cash farm income dropping only slightly from last year.

Higher government payments likely will make up most of the drop in market receipts.

USDA likely will revise down estimates for 2005 due to the spike in energy prices and weaker grain and oilseed prices.
How inelastic is nutrient demand?

Own Price Elasticity = \frac{\text{Percentage Change in Quantity}}{\text{Percentage Change in Price}}

U.S. Nutrient Demand Elasticities for Corn

<table>
<thead>
<tr>
<th></th>
<th>Short Run</th>
<th>Long Run</th>
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<tbody>
<tr>
<td>Nitrogen</td>
<td>-0.23</td>
<td>-0.48</td>
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<tr>
<td>Phosphorus</td>
<td>-0.02</td>
<td>-0.30</td>
</tr>
<tr>
<td>Potassium</td>
<td>-0.16</td>
<td>-0.27</td>
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- There are no substitutes for nitrogen, phosphate and potash
- A large price change does not impact the profit maximizing application rate (maximum economic yield or MEY)
- Nutrients still account for a relatively small percentage of total production costs and are a small percentage of total revenue
Moderate declines in P application rates on corn

Data for the last 15 years show no correlation between phosphate application rates on corn and phosphate prices.

Phosphate application rates on corn are weakly correlated with corn prices.

This model predicts that at current new crop (2006) corn prices phosphate application rates on corn would total 46 lbs $P_2O_5$ per planted acre. Our forecast uses 44 lbs due to a spook factor.
Higher energy prices favor soybeans over corn

Estimated Variable Cost for an Iowa Farm

Source: Iowa State University and Mosaic

Estimated Revenue after Variable Cost for an Iowa Farm

Source: Iowa State University and Mosaic
A modest switch from corn to soybeans is expected.
U.S. phosphate use is forecast to decline 5%

U.S. phosphate use in 2005/06 is forecast to decline about 5% from the estimated level of last year.

The forecast is based on a modest shift from corn to soybeans, a slight increase in wheat acreage and moderate declines in phosphate application rates.
U.S. phosphate shipments are forecast to decline 5%

U.S. shipments of processed phosphate in 2005/06 are forecast to decline about 5% from last year.

Projected shipments are near the low end of the 15-year range and follow a 3% drop last year.

Anecdotal evidence indicates that distribution pipeline stocks on October 31 likely were less than average.
DAP and MAP domestic shipments were down 14% during the first quarter of the 2005/06 fertilizer year (Jul-Sep). September shipments were off sharply due to production losses and logistical complications following hurricane Katrina as well as heavy export commitments to India and Pakistan.

Shipments are projected to decline 11% during the first half of the fertilizer year due to demand uncertainties and strong exports. Some U.S. farmers may postpone nutrient application this fall in order to see where energy and fertilizer prices may go this spring.

Given the expected decline in shipments this fall, movement during Jan-Jun 2006 is projected to increase about 2% from last year.
The U.S. industry ran at higher rates during the first quarter of the fertilizer year (JAS) due to large export commitments this year and greater hurricane losses last year.

Phosphoric acid production during the JAS quarter was up 7% and DAP/MAP production was up 6% or 200,000 tonnes from a year ago.

Phosphoric acid production during the OND quarter is projected to drop 11% or more than 300,000 tonnes \( \text{P}_2\text{O}_5 \) and DAP/MAP production is projected to drop 15% or almost 600,000 tonnes from a year ago due to hurricane-related losses and anticipated plant closures in the United States.

Estimates of hurricane-related losses continue to climb due to sulphur shortages.

U.S. DAP/MAP production in 2005/06 now is projected to drop almost 5% or more than 750,000 tonnes from last year.
Large hurricane-related losses coupled with continued strong export shipments are expected to pull stocks below the low end of the 10-year range this fall.

Stocks are projected to climb during DJF due to a seasonal slowdown in offshore and domestic shipments as well as a recovery in U.S. production. Stocks are not projected to balloon to the high levels of last year.

The combination of a seasonal up-tick in domestic shipments beginning in Q1 06, a return of key importers in Q2 06, and lower production resulting from anticipated plant closures results in a pull-down of stocks in April and May 2006 to levels comparable to this year.
DAP and MAP are not the whole story

Phosphoric acid is the most comprehensive measure of phosphate production.

After bottoming at 78% of capacity in 2000/01, the U.S. phosphoric acid operating rate has climbed steadily to the mid-90% range today.

This trend is the result of both permanent plant closures as well as increases in acid production.

Acid output has increased to make more high analysis fertilizer such as DAP, MAP and TSP, but more acid also is required to meet the growing demand for other uses.

The difference between total acid production and the estimated acid used for high analysis fertilizer production has increased from 2.2 million tonnes $P_2O_5$ in 2000/01 to 3.0 million tonnes in 2004/05 (light green part of bar).

A growing portion of this acid is upgraded to purified products that are used in a variety of industrial and food applications. Wet process technologies are replacing thermal acid production due to prohibitive energy costs.

In addition, producers are processing more acid into feed phosphate. Growing concerns about the safety of feed ingredients made from animal by-products are boosting the demand for feed phosphate worldwide.
Thank You!

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