Industrial & Food Grade Phosphoric Acids

Market Update: April 2008
World Phosphoric Acid
$P_2O_5$ Distribution

- DAP: 37%
- MAP: 24%
- TSP: 18%
- Other: 5%
- Feed: 8%
- Food & Industrial: 8%
Global Fertilizer Market

Demand for fertilizers has increased dramatically.

• What is driving this growth?
  
  – Rising population
  – Increasing wealth
  – Diet improvement
  – Biofuels (Ethanol, Biodiesel)
World Grain Production and Consumption

Wheat & Coarse Grains

Production
Consumption

Billion Tonnes

Near Perfect Weather Year
Production Gap
World Ethanol and Biodiesel Production

Billion Gallons

- Brazil Ethanol
- US Ethanol
- World Biodiesel
- World Ethanol


3X
5X
Evolution of Phosphoric Acid Production

- Production has moved from Thermal Process (electricity, elemental phosphorus) to Purified Wet Process (PWA)

- PWA raw material = Merchant Grade Phosphoric Acid (MGA)
  - (MGA = phosphate rock + sulfuric acid)

- Major use of MGA: Raw material in fertilizer production

- Industrial and Food Grade Phosphoric Acid now directly linked to Agricultural Market
**Phosphate – A Simplified Flow Diagram**

Primary Product | Primary Use
---|---
Phosphate Rock | To phosphate fertilizer producers; for direct application on acidic soil
MGA (54% P_2O_5) | To fertilizer producers; to dealers that custom-mix fertilizers

**Liquid Fertilizers**
- Superphosphoric Acid (70% P_2O_5)
  - To dealers that add ammonia and custom-mix fertilizers
  - 11-37-0
  - 10-34-0
  - To dealers that custom-mix fertilizers

**Feed and Industrial**
- Dical, Monocal and DFP
  - Poultry, cattle and swine feed supplements
- Technical-Grade and Food-Grade DAP
  - Food and beverage products, metal treatment, detergents and electronics
- Solid Fertilizer
  - DAP and MAP
  - To dealers that custom-mix fertilizers; most DAP is exported

Phosphate ore from the mine → Screen, wash, float & dewater → Phosphate Rock → Phosphoric Acid Plants

Calcination → Phosphoric Acid (P_2O_5) → Super-phosphoric Acid Plant

Add ammonia → Animal Feed Plants

Sulfuric Acid → Sulfuric Acid Plants

Purchased Sulfur → Cogeneration of Electricity & Steam

Solid Fertilizers Plants → Add ammonia
Global Fertilizer Market

Demand for fertilizers has increased dramatically.

- The result: Tight Supply-Demand balance for MGA / Phosphate Rock
  - India - MGA price increased from $565 to $1,985/mt P$_2$O$_5$. Subject to increase 7/2008
  - Europe - April 2008 $1,700/mt P$_2$O$_5$ MGA increase vs. 2007
  - Rock costs increased to $350 to $400/mt from $60 in Europe
  - PCS sulfur costs increased seven fold vs. 2007

- Estimates are these conditions will exist for 3+ years
Effect on Purified Phosphoric Acid

- All products made from MGA face cost increases and limited supply of this major raw material.

- MGA supply will go to the product with the best economic return

- $P_2O_5$ demand expected to increase by 2 million mt in 2008

- Purified Phosphoric Acid prices must increase to justify availability of MGA.
China

- Chinese government has repealed the VAT rebate on exports of phosphate salts and phosphoric acid
- Chinese government has placed a 100% export tax on $P_2O_5$ – containing product effective April – Sept. 2008
- Chinese acid and phosphates costs will more than double on the strength of this action
- U.S. has confirmed countervailing duty of 183% on imports of Chinese SHMP
- Phosphorus price for export per mt, FOB Chinese port has increased from $2,600 to $3,400. Price could double based on export tax implementation
- 85% phosphoric acid, in drums, FOB China increased to $900mt (.41 per lb.) from $770 - $815 (.35 - .37 per lb.). Price could double based on export tax implementation
Thank you