Chemicals for the Non-Chemist

Plant Nutrients and Plant Nutrient Markets

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Vice President
Market and Strategic Analysis
The Mosaic Company
Safe Harbor

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The Mosaic Company
Mosaic helps the world grow the food it needs by mining phosphorus (P) and potassium (K) minerals and refining these ores into plant nutrient products that are essential for global agriculture.

Our North American operations typically dig, pump, cut, convey and hoist nearly 95 million tonnes of raw P&K ores from the earth each year. We remove the sand, clay, salt and other elements to produce approximately 23 million tonnes of refined ores.

We then process these refined ores into about 17 million tonnes of finished products using an additional five million tonnes of purchased or manufactured raw materials such as sulphur and anhydrous ammonia.
The Mosaic Company

Mosaic’s U.S. Phosphate Operations

Based on 2013 production
Mosaic's $P_2O_5$ production includes CF Industries' phosphate business
$P_2O_5$ production based on PACID and SSP production
$K_2O$ production based on MOP, SOP, and KMS production
Source: Company reports, IFA, CRU, Fertecon and Mosaic

Chemicals for the Non-Chemist
The Mosaic Company

Mosaic’s NA Potash Operations

- Colonsay
- Regina
- Esterhazy K1 & K2
- Belle Plaine
- Thunder Bay
- Plymouth
- Vancouver
- Portland
- Carlsbad

Corporate Headquarters
Business Unit Office
Deep Shaft Mine
Solution Mine
Port

DAP/MAP/MES/TSP Sales by Market
- Offshore 56%
- North America 44%
Total DAP/MAP/MES/TSP Sales: 61 Mil MT

MOP Sales by Market
- North America 51%
- Offshore 49%
Total MOP Sales: 50 Mil MT

Average for calendar yr ’06 - ’13
Source: Mosaic

Chemicals for the Non-Chemist
Plant Nutrients
Plant Nutrients

- Plant nutrients are plant food (and common chemical elements)
- 17 chemical elements are required for plant growth

<table>
<thead>
<tr>
<th>Non-Mineral Elements</th>
<th>Macronutrients</th>
<th>Micronutrients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Primary</td>
<td>Secondary</td>
</tr>
<tr>
<td>C - Carbon</td>
<td>K - Potassium</td>
<td>Ca - Calcium</td>
</tr>
<tr>
<td>H - Hydrogen</td>
<td>N - Nitrogen</td>
<td>Mg - Magnesium</td>
</tr>
<tr>
<td>O - Oxygen</td>
<td>P - Phosphate</td>
<td>S - Sulphur</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B - Boron</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cl - Chlorine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cu - Copper</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fe - Iron</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mn - Manganese</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mo - Molybdenum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ni - Nickel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Zn - Zinc</td>
</tr>
</tbody>
</table>

- Justus von Liebig and the Law of the Minimum
- N-P-K: the carbohydrates, protein and fat of a plant’s diet
- Growing importance of secondary nutrients and micronutrients especially in high yield systems
Plant Nutrient Products

- Plant nutrients are contained in a variety of products
  - Much like nutrients for animals are contained in a variety of feed ingredients
  - Each plant nutrient product is identified by three numbers
    - Referred to as its “analysis”
    - Percentage of each primary nutrient contained in a unit of the product

Plant Nutrient Analysis

29-0-4 Lawn Fertilizer

20-0-0 Liquid Fertilizer

20-27-5 Starter Fertilizer

Urea
46-0-0

Diammonium Phosphate (DAP)
18-46-0

Muriate of Potash (MOP)
0-0-60
The Challenge: Maintaining Soil Fertility and Safeguarding the Environment

- Soil fertility is maintained by replenishing the nutrients removed by crops each year.
- Farmers maintain soil fertility and safeguard the environment by following the 4-Rs of nutrient stewardship.
- The 4-Rs of nutrient stewardship:
  - Right source
  - Right rate
  - Right time
  - Right place
- Best practices:
  - Soil testing
  - Plant nutrient accounting
  - Variable rate technology
  - Multiple applications
  - Nitrogen inhibitors and slow release products

### Nutrient Removal by Crop

<table>
<thead>
<tr>
<th>Crop</th>
<th>N</th>
<th>P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt;</th>
<th>K&lt;sub&gt;2&lt;/sub&gt;O</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Corn - 200 Bu Acre Yield</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grain</td>
<td>180</td>
<td>76</td>
<td>54</td>
<td>16</td>
</tr>
<tr>
<td>Stalks</td>
<td>90</td>
<td>32</td>
<td>220</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>270</td>
<td>108</td>
<td>274</td>
<td>30</td>
</tr>
<tr>
<td><strong>Soybeans - 70 Bu Acre Yield</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grain</td>
<td>266</td>
<td>59</td>
<td>91</td>
<td>13</td>
</tr>
<tr>
<td>Stover</td>
<td>77</td>
<td>17</td>
<td>70</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>343</td>
<td>76</td>
<td>161</td>
<td>25</td>
</tr>
<tr>
<td><strong>Wheat - 80 Bu Acre Yield</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grain</td>
<td>120</td>
<td>48</td>
<td>27</td>
<td>8</td>
</tr>
<tr>
<td>Straw</td>
<td>56</td>
<td>13</td>
<td>96</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>176</td>
<td>61</td>
<td>123</td>
<td>19</td>
</tr>
</tbody>
</table>

Source: IPNI
Increasing Efficacy of Plant Nutrient Use

The efficacy of plant nutrient use has increased significantly in the United States during the last few decades. U.S. Department of Agriculture data show that the three-year average U.S. corn yield nearly doubled from 79 bushels per acre in 1970 to 157 bushels per acre in 2010. Yet primary nutrient application rates remained flat at 230 pounds per acre during the same period.

Nitrogen use per bushel of corn harvested declined one-third or from about 1.45 pounds in 1970 to less than 0.9 pounds in 2010. Phosphorus use per bushel of corn dropped more than 60% from about 0.7 pounds in 1970 to roughly 0.3 pounds in 2010. Potassium use per bushel of corn also dropped more than 60% from about 0.8 pounds in 1970 to 0.3 pounds in 2010.

Manure usage has increased during this period, but **U.S. farmers today are harvesting twice as much corn per acre with the same amount of commercial plant nutrients as used in 1970!**

Source: USDA, AAPFCO, TFI
Critical Role of Plant Nutrients

- Plant nutrients are responsible for 40% to 60% of crop yields
- Vital role in meeting the challenge of feeding more than nine billion people in 2050

No one understood this challenge better or communicated it more effectively than Dr. Norman Borlaug. Borlaug, widely acclaimed as the Father of the Green Revolution, developed disease resistant and high yielding wheat varieties that are credited with saving hundreds of millions of people from starvation in the 1960s and 1970s. India’s wheat output doubled from 12 million tonnes in 1965 to 24 million tonnes in 1975. Veterans of the Green Revolution joyfully recount how the country frequently ran out of jute bags to store and transport the bountiful harvests.

Borlaug, the strong farm boy (and accomplished wrestler) from Cresco, Iowa and a proud graduate of the University of Minnesota, won the Nobel Peace Prize in 1970 for the development of these new varieties as well as his tireless efforts to work with farmers to gain their acceptance. Borlaug was driven by his strong conviction that it is impossible to build a peaceful world on empty stomachs.

“Farmers can feed the world. Better seeds and fertilizer, not romantic myths, will let them do it.”

“...to feed 6.6 billion people. Without chemical fertilizer, forget it. The game is over.”

Dr. Norman Borlaug
Wall Street Journal
July 30, 2009

Dr. Norman Borlaug
New York Times
April 30, 2008
Primary Plant Nutrient Overview

- **Nitrogen (N)**
  - Production process: highly energy intensive Haber-Bosch process to synthesize ammonia (NH\(_3\)) from inert atmospheric N and H
  - Key input: hydrocarbon feed stock (two-thirds produced from natural gas)
  - Global agricultural use: ~112 million tonnes N in 2013 or about 305 million tonnes of product
  - Main nitrogen products
    - Anhydrous ammonia (82% N – gas at normal temperatures and pressures)
    - Urea-ammonium nitrate (UAN) solution (28%-32% N – liquid)
    - Urea (46% N – solid)
    - Ammonium nitrate (34% N – solid)
    - Ammonium sulphate (21% N – solid)
    - Ammonium phosphate (DAP and MAP) products (10%-18% N – solid)
  - Leading producers: China, India, Russia, United States, Indonesia, Trinidad and Tobago, Ukraine, Canada, Middle East
The synthesis of ammonia as developed and commercialized by two German chemists, Fritz Haber and Carl Bosch, during the early decades of the last century. Haber is credited with developing the theory and achieving the first synthesis of ammonia in a laboratory in 1909. He was awarded the Nobel Prize in Chemistry in 1918 for this discovery.

BASF, the large German company and mainly a producer of dyes at the time, purchased the rights to this new process and charged Bosch with the formidable task of commercializing it. Bosch’s biggest challenge was developing the high pressure vessels required for the large scale and continuous production of ammonia. He and his team succeeded, and the first commercial production of ammonia took place at Oppau, Germany exactly 100 years ago in 1913. Bosch shared the Nobel Prize in Chemistry in 1931 for his work on developing high pressure vessels that are widely used in several chemical processes today.

If Haber and Bosch were the fathers of this important invention, necessity, indeed, was its mother. At the time, saltpeter or potassium nitrate was the leading plant nutrient product as well as the main ingredient in gun powder. The world relied on dwindling supplies from Chile’s Atacama desert. British scientists had warned of the consequences of an impending shortage on wheat yields and Allies had cut off Germany from this important raw material for the production of munitions during World War I. The oxidation of ammonia provided a new source of both nitrogen fertilizer and explosives.

Without ammonia, there would be no inorganic fertilizers, and nearly half the world would go hungry. Of all the century’s technological marvels, the Haber-Bosch process has made the most difference to our survival.”

Vaclav Smil
Nature
July 29, 1999
Primary Plant Nutrient Overview

- Phosphate (P)
  - The production process - making phosphorus water soluble
  - Key inputs: phosphate rock mineral ore, sulphur and ammonia
  - Global agricultural use: ~48 million tonnes P$_2$O$_5$ in 2013 or about 125 million tonnes of product
  - Main phosphate products
    - Diammonium phosphate (DAP) (46% P$_2$O$_5$ – solid)
    - Monoammonium phosphate (MAP) (52% P$_2$O$_5$ – solid)
    - Triple superphosphate (TSP) (46% P$_2$O$_5$ – solid)
    - Single superphosphate (SSP) (18%-22% P$_2$O$_5$ – solid)
    - NPK and NP compounds (% P$_2$O$_5$ varies – both solid and liquid)
  - Leading producers: China, United States, Morocco/North Africa, India, Russia, Brazil
Global Phosphate Rock Production

Phosphate Rock Production
Average 2009 - 2013
- <3.0 million tonnes
- 3.0 - 15.0 million tonnes
- 15.0 - 30.0 million tonnes
- >30.0 million tonnes

Source: CRU and Mosaic
Million Tonnes of Phosphate Rock
Primary Plant Nutrient Overview

- **Potash (K)**
  - Production process: simple separation processes
  - Key inputs: potash mineral ore (sylvinit, carnallite and langbeinite)
    - Conventional underground mines (1000+ meters deep)
    - Solution mines
    - Salt lake brines (e.g. Dead Sea, Qinghai and Great Salt Lake)
  - Global agricultural use: ~29 million tonnes K$_2$O in 2013 or about 60 million tonnes product
  - Main potash products
    - Potassium chloride or muriate of potash (MOP) (60-62% K$_2$O – solid)
    - Potassium sulphate or sulphate of potash (SOP) (50% K$_2$O – solid)
    - Potassium-magnesium-sulphate (22% K$_2$O – solid)
  - Leading producers: Canada, Russia, Belarus, Germany, China, Israel, Jordan
Global MOP Production

MOP Production
Average 2009 - 2013
- <1.0 million tonnes
- 1.0 - 3.0 million tonnes
- 3.0 - 8.0 million tonnes
- >8.0 million tonnes

Source: Fertecon and Mosaic
Million Tonnes of MOP

Chemicals for the Non-Chemist
Crop Nutrients Markets
Crop Nutrient Markets

- A separate and unique market for each nutrient
  - Common demand drivers
  - Different supply drivers
    - Natural resources required
    - Other raw materials
    - Location of resources
    - Technological processes

- Market characteristics
  - Global
    - Highly traded commodities
    - By a large number of trading companies
  - Long and large supply chain
  - Commodity based
  - Cyclical

<table>
<thead>
<tr>
<th>Global Plant Nutrient and Grain Trade</th>
<th>Global Use</th>
<th>International Trade</th>
<th>Trade as a % of Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coarse Grain</td>
<td>1,148.7</td>
<td>134.4</td>
<td>12%</td>
</tr>
<tr>
<td>Wheat</td>
<td>674.4</td>
<td>146.3</td>
<td>22%</td>
</tr>
<tr>
<td>Rice</td>
<td>455.4</td>
<td>37.5</td>
<td>8%</td>
</tr>
<tr>
<td>Total Grain</td>
<td>2,278.4</td>
<td>318.1</td>
<td>14%</td>
</tr>
<tr>
<td>Nitrogen (N)</td>
<td>107.1</td>
<td>45.6</td>
<td>43%</td>
</tr>
<tr>
<td>Phosphate (P₂O₅)</td>
<td>40.4</td>
<td>24.1</td>
<td>60%</td>
</tr>
<tr>
<td>Potash (K₂O)</td>
<td>27.6</td>
<td>23.2</td>
<td>84%</td>
</tr>
<tr>
<td>Total Nutrients</td>
<td>175.1</td>
<td>92.8</td>
<td>53%</td>
</tr>
</tbody>
</table>

Source: USDA, U.S. Dept. of Commerce, IFA, Fertecon, Mosaic
Grain trade: five crop year averages 2009/10 - 2013/14
Plant nutrient trade: five calendar year averages 2009 - 2013
Plant nutrients include intra-North American and intra-European trade.
Nitrogen trade includes ammonia, urea, ammonium nitrate, ammonium sulphate, calcium ammonium nitrate, DAP and MAP. Phosphate trade includes rock, phosphoric acid, DAP, MAP, TSP and SSP. NPKs are not included.
Market Characteristics

- **Long and large supply chain**
  - Production
    - Typically located near the source of the natural resource (i.e. long pipeline)
    - Operates 24-7-365
  - Farm application
    - One or two short application windows (i.e. large pipeline)
  - Pipeline flow
    - Regular flow required to
      - Have product in place when farmers want to apply it
      - Keep mines and plants running
    - Flow impacted by
      - Weather
      - Price expectations
      - Supply/demand changes
Market Characteristics

• Long and large supply chain - example

Florida DAP to India

It takes 50 to 75 days to deliver DAP from a producer in Florida to a farmer in the Punjab state of India. The process begins with the staging and loading of 55,000 tonnes of DAP onto a panamax vessel at the port of Tampa. This may take four to six days if Mother Nature cooperates and may involve one to three load berths.

Once loaded, the vessel will set sail for the west coast of India. The voyage will take about 32 days through the Suez Cannel or about 41 days around Cape Hope. Most vessels today move through the Suez Cannel (with armed guards), but some sail around the cape due to the risk of seizure by pirates along the northwest coast of Africa and the higher costs of the Suez route (pirates indeed have seized phosphate vessels in the past).

Once at a west coast port, the vessel will discharge and the 55,000 tonnes of DAP will get bagged into 1.1 million 50 kilogram bags at the port. The discharge takes three to ten days depending on port facilities, and bagging requires an extra five to ten days if the weather and bagging machines cooperate. The bags of DAP then are either loaded directly from the port onto rail cars and shipped to Punjab or stored in a port warehouse and transported at a later date. Transit time to Punjab is about seven days.
The Phosphate Market and Industry
Global Phosphate Product Shipments (DAP/MAP/TSP)

Global Phosphate Shipments

Source: CRU and Mosaic

High Analysis Phosphate Shipments by Region

Source: Fertecon, IFA and Mosaic

Chemicals for the Non-Chemist
Global Phosphate Product Production (DAP/MAP/TSP)

Top Producing Countries

- China
- USA
- India
- Morocco
- Russia
- Brazil
- Saudi Arabia
- Tunisia
- Mexico
- Australia

Top producers in 2013
Source: Fertecon, IFA and Mosaic
Phosphate Product Trade (DAP/MAP/TSP)

Top Exporting Nations

1. USA
2. China
3. Morocco
4. Russia
5. Saudi Arabia
6. Tunisia
7. Lithuania
8. Mexico
9. Jordan
10. Australia

Top Importing Nations

1. Brazil
2. India
3. Vietnam
4. Pakistan
5. Argentina
6. Australia
7. USA
8. Bangladesh
9. Canada
10. Thailand

Top exporters in 2013
Source: Fertecon, IFA and Mosaic

Top importers in 2013
Source: Fertecon, IFA and Mosaic

Chemicals for the Non-Chemist
Phosphate Product Trade (DAP/MAP/TSP)

Based on 2012 imports and exports
The USA and Australia are both top 10 importers and exporters
Source: IFA, Fertecon and Mosaic
Transition of the Chinese Phosphate Industry

Source: Fertecon, IFA and Mosaic
Peak Phosphate: Academic Not Economic Issue

Peak phosphorus is a hot research topic in academic circles today.

Following the model of Hubbert’s Peak Oil, a few recent studies have concluded that phosphate rock production will peak during the next 20 to 40 years and then decline sharply during the last half of this century. Proponents warn that depletion of phosphorus resources will imperil food supplies and concentrate economic and political power in countries such as Morocco that possess the largest reserves.

Critics of these studies acknowledge that phosphate rock is a finite and nonrenewable resource and support ongoing efforts to further improve the efficacy of phosphorus production, use and recycling. However, they contend that most peak phosphorus studies utilize outdated estimates of rock reserves and fail to fully account for the impact of higher market prices and new technology on resource estimates. They conclude that global phosphate rock reserves exceed estimates used in these studies by a wide margin and, as a consequence, see no threat of peak phosphorus production later this century.

<table>
<thead>
<tr>
<th>Billion Tonnes</th>
<th>Reserve Estimates</th>
<th>Resource Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>300 to 350 years of production at current rates</td>
<td>More than 1,525 years of production at current rates</td>
</tr>
<tr>
<td>250</td>
<td>USGS (2014) Preliminary Reserve Estimate 67</td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>IFDC (2010) Preliminary Reserve Estimate 60</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>Source: USGS and IFDC</td>
<td></td>
</tr>
</tbody>
</table>

Are we running out of $30 tonne rock?  Yes.
Are we running out of $150 tonne rock? Not for a while.
Are we running out of $300 tonne rock? Not for a long time.

Peak Phosphorus?

Chemicals for the Non-Chemist
Global Phosphate Rock Production

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Source: Fertecon, IFA and Mosaic

**Phosphate Rock Production by Region**

- **1995**
  - 138 mil tonnes
  - China: 34%
  - Asia and Oceania: 2%
  - Latin America: 19%
  - North America: 9%
  - Europe and FSU: 4%

- **2013**
  - 185 mil tonnes
  - China: 32%
  - Asia and Oceania: 15%
  - Latin America: 8%
  - North America: 6%
  - Europe and FSU: 4%

Source: Fertecon, IFA and Mosaic

**Top Phosphate Rock Producing Countries**

- China
- USA
- Morocco
- Russia
- Brazil
- Jordan
- Egypt
- Peru
- Israel
- Saudi Arabia

Top producers in 2013

Source: Fertecon, IFA and Mosaic
Phosphate Rock Trade

Top Exporting Countries

- Morocco
- Jordan
- Peru
- Russia
- Syria
- Algeria
- Togo
- Israel
- Christmas Island

Mil Tonnes

Source: Fertecon, IFA and Mosaic
Top exporters in 2013

Phosphate Rock Trade

Top Importing Countries

- India
- USA
- Brazil
- Indonesia
- Poland
- Lithuania
- Belgium
- Malaysia
- Norway
- Mexico

Source: Fertecon, IFA and Mosaic
Top importers in 2013
The Potash Market and Industry
Global Potash Shipments (MOP)

Source: CRU and Mosaic

Potash Shipments by Region

1995
37 mil tonnes KCl

- China: 26%
- Asia and Oceania: 2%
- Latin America: 12%
- North America: 11%
- Europe and FSU: 29%
- Other: 20%

2013
54 mil tonnes KCl

- China: 22%
- Asia and Oceania: 3%
- Latin America: 18%
- North America: 21%
- Europe and FSU: 20%
- Other: 20%

Source: Fertecon and Mosaic

Chemicals for the Non-Chemist
Global Potash Production (MOP)

MOP Production by Region

Source: Fertecon and Mosaic

Top MOP Producing Countries

Source: Fertecon and Mosaic
Top producers in 2013
Potash Trade (MOP)

Top MOP Exporting Countries

Top MOP Importing Countries

Source: Fertecon and Mosaic
Includes inter-regional transactions

Top exporters in 2013
Source: IFA, Fertecon and Mosaic

Top importers in 2013
Source: IFA, Fertecon and Mosaic
Impact of Former Soviet Union Break-Up

Source: Fertecon and Mosaic
The Nitrogen Market and Industry
Global Urea Production

![Global Urea Production Chart]

- **Top Producing Nations:**
  - China
  - India
  - Indonesia
  - USA
  - Russia
  - Qatar
  - Pakistan
  - Egypt
  - Iran
  - Canada

**Source:** IFA

*Top producers in 2013*

- **Global Urea Production Chart**

Source: Fertecon, CRU and Mosaic Average 2009-2013
Urea Trade

Source: IFA
Top exporters in 2013

Source: IFA
Top importers in 2013
Ever Evolving U.S. Nitrogen Industry

**Natural Gas Costs in Key Nitrogen Producing Regions**

Estimated Annual Average Price

- **Mil Tonnes**
  - U.S. Gross Ammonia Production

Source: Fertecon

Source: Fertecon

Chemicals for the Non-Chemist
This presentation and other products available on the Mosaic website

- Mosaic Stakeholder Handbook
- Market Mosaic
- Market Alerts
- Past Presentations

http://www.mosaicco.com/resources/market_analysis.htm
Mosaic Stakeholder Handbook

http://www.mosaicco.com/resources/mosaic_stakeholder_handbook.htm

Global Phosphate Rock Production

The Leading Phosphate Products

DAP, MAP, and Urea are the most widely used phosphate products in the world. DAP is produced by the hydrolysis of phosphoric acid to produce monoammonium phosphate (MAP) and urea. MAP is produced by the addition of ammonia to MAP. Urea is produced by the addition of carbon dioxide to phosphoric acid. Phosphoric acid is produced by the reaction of phosphoric acid with water.

Phosphoric acid is produced in a molten state. It is then converted to a liquid state by the addition of water. Phosphoric acid is then converted to a solid state by the addition of a solid ingredient. Phosphoric acid is then converted to a liquid state by the addition of water. Phosphoric acid is then converted to a solid state by the addition of a solid ingredient.

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Underground Ore Deposits and Mining Techniques

Underground ore deposits are mined using either open-pit or subterranean mining techniques. Open-pit mining operates on the surface, while underground mining operates below ground. Open-pit mining typically involves the use of blast holes and rock breakers, while underground mining typically involves the use of underground drills and rock breakers.

Phosphate Use by Crop

Use with many crops provides significant benefits, including increased yields and improved crop quality. The use of phosphate with crops such as corn, soybeans, and wheat can increase yields by 20% to 30%. Phosphate is an essential nutrient for plants and is used in the production of many fertilizers.

Typical Underground Sydicate Ore Mining Diagram

The diagram shows a typical underground sydicate ore mining operation. The operation consists of a main shaft, which is used to access the ore body. The ore body is then accessed using crosscuts, which are tunnels that extend from the main shaft. The ore body is then accessed using stopes, which are tunnels that extend from the crosscuts. The ore body is then accessed using tunnels, which are tunnels that extend from the stopes. The ore body is then accessed using drifts, which are tunnels that extend from the tunnels. The ore body is then accessed using drifts, which are tunnels that extend from the tunnels.

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Thank You!

Chemicals for the Non-Chemist

Plant Nutrients and Plant Nutrient Markets

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