Impact and Possible Response to High Fertilizers Prices

FAO Plant Production and Protection Division
• Fertilizer prices have risen over the past several months because of high energy prices.
• Important exporters including China, Russia, and Egypt have slowed exports to safeguard domestic supply.
• Energy Prices increase (the crude oil ≈$70 to ≈$100/barrel)
• Russia exports 12.6% of total exported fertilizers
• Spikes in prices might be expected as the Russian-Ukrainian conflict adds to fears of global shortages.
• Disruption in production or distribution could affect the availability of fertilizers.
Regional fertilizers consumption

- Asia is the major region for fertilizer consumption (over 50% of global N, P2O5 and K2O demand); indicating a significant shakes in this region.

- In Africa region with already relatively low use of fertilizers in terms of % global fertilizer use, the overall impact on production may be less dramatic than in other Regions.
The current situation of fertilizers in different regions

Some members are taking measures to mitigate the impact of the fertilizers price increase

**WORLDWIDE**
Fertilizer exporting countries have placed restrictions on exports.

**ASIA**
Major markets in Asia, increased financial support through fertilizer subsidies.

Fertilizer price increase is less likely to result in a reduction in demand in Europe; this increase in cost of fertilizers could adversely impact food production costs resulting in future increase the food prices.

**EUROPE**
Already facing limited access to fertilizers in terms of affordability the availability and accessibility are the major concern.

**AFRICA**
Where significant fertilizers production capacity exists in some regions, may be less affected in terms of access to fertilizers but it remains affected by the increase in prices of fuels, transportation, insurance...etc.

**OTHER REGIONS**

Some members are taking measures to mitigate the impact of the fertilizers price increase.
Major Challenges by Region:

**ASIA**
1. Overuse of Fertilizer is highlighted as a major challenge in Asia
2. Specifically Access to Nitrogen fertilizers for Rice production that uses high levels of Nitrogen
3. Low market price for rice and high inputs cost of nitrogen makes rice production for coming season less attractive to farmers.

**EUROPE**
1. Fertilizer production plants have closed due to high energy prices
2. Increased prices of fertilizers may translate to increase in food prices and inflation

**AFRICA**
1. Underuse of fertilizers in sub-Saharan Africa is a recognized difficulty and farmers have little experience with fertilizers and its potential to enhance crop yields
2. High transporation and logistics cost impact negatively on fertilizer availability
3. Increased price of fertilizers may cause reduction in access to farmers

**Latin America and Caribbean**
1. Increased prices due to limited supply and transport and logistics cost
2. The major food and oil crops are highly dependent on mineral fertilizers therefore, instability in fertilizer markets will have impact on food security.

**Near East and North Africa**
1. Low fertilizers use efficiency is a concern where mineral fertilizers are used and measures should be employed to optimize fertilizer use
Soil fertility

Fertilizer Use & Management

Sustainable Plant Nutrition

Nutrient Reuse and Recycling

Policies & Regulations

NSP Response to High Fertilizers Prices
Recommendations for increasing efficient use of fertilizers

1. Following the 4R's of Nutrient Stewardship
2. Plant nutrients available from sources other than mineral fertilizers
3. Utilization of Biofertilizers and biosimulants
4. Utilization of Slow-/Controlled-Release Fertilizers
5. Follow intercropping or crop rotation
6. To industrial sector
To farmers and crops production sector:

A- Following the 4R's of Nutrient Stewardship

- Right Fertilizers source
- Right application rate
- Right time
- Right place
B- Plant nutrients available from sources other than mineral Fertilizers.

<table>
<thead>
<tr>
<th>Type</th>
<th>% nutrient content</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Poultry manure</td>
<td>2 - 4</td>
</tr>
<tr>
<td>Feedlot manure</td>
<td>2 - 3</td>
</tr>
<tr>
<td>Dairy manure</td>
<td>1 - 2</td>
</tr>
<tr>
<td>Urban yard waste</td>
<td>1 - 1.5</td>
</tr>
<tr>
<td>Crop residue</td>
<td>1.5 - 2.5</td>
</tr>
</tbody>
</table>

Composting

Utilization of machinery

Pelletized Manure
C- Utilization of Biofertilizers and Biosimulants:

<table>
<thead>
<tr>
<th>Biofertilizer</th>
<th>Function</th>
<th>Crops</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Rhizobium</em> (symbiotic)</td>
<td>- Fixes 200–300 kg N/ha/year</td>
<td>Pulses and legumes</td>
</tr>
<tr>
<td></td>
<td>- Increases yield up to 10–30%</td>
<td></td>
</tr>
<tr>
<td><em>Azotobacter</em></td>
<td>- Supplies 20–40 kg N/ha/year</td>
<td>Cereals, Mustard, sunflower, cow pea, sugarcane, grapes, papaya, watermelon, tomato...etc.</td>
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<tr>
<td></td>
<td>- Increase yield up to 10–15%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Promote growth substances</td>
<td></td>
</tr>
<tr>
<td><em>Azospirillum</em></td>
<td>- Fixes 20–160 kg N/ha/year</td>
<td>Rice, sugarcane, millet, wheat, sorghum, pearl millet ...etc.</td>
</tr>
<tr>
<td></td>
<td>- Production of plant hormones</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Increase crop yield</td>
<td></td>
</tr>
<tr>
<td><em>Blue-green algae</em></td>
<td>- Supplies 20–40 kg N/ha/year</td>
<td>Rice</td>
</tr>
<tr>
<td></td>
<td>- Promote growth substances</td>
<td></td>
</tr>
<tr>
<td><em>Azolla</em></td>
<td>- Fixes 30–60 kg N/ha/year</td>
<td>Rice</td>
</tr>
<tr>
<td></td>
<td>- Used as green manure</td>
<td></td>
</tr>
<tr>
<td><em>Bacillus sp.</em></td>
<td>- Phosphorus solubilization (30–140 kg/ha)</td>
<td>Pulses, cereals, vegetable ...etc.</td>
</tr>
<tr>
<td></td>
<td>- Promote growth substances</td>
<td></td>
</tr>
<tr>
<td><em>Mycorrhiza</em></td>
<td>- Solubilization of phosphate (35–70 kg/ha)</td>
<td>Pulses, cereals, vegetable ...etc.</td>
</tr>
<tr>
<td><em>Glomus, Gigaspora, Sclerocystis, Acaulospora, Scutellospora</em></td>
<td>- plant hormones production,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Improves root morphology</td>
<td></td>
</tr>
</tbody>
</table>


Amount of nitrogen and phosphorus afforded by different microbial strains.

D- Utilization of Slow-/Controlled-Release Fertilizers:

Chemical Economics Handbook, Controlled- and Slow-Release Fertilizers - Chemical Economics Handbook (CEH) | IHS Markit
E- Following intercropping or crop rotation:

Integrating fertilizer-intensive crops like cereals such as maize; wheat and rice with crops that have low fertilization requirements or nitrogen fixing ability like pulses and legumes will help to reduce the reliance on mineral fertilizers.
• **To industrial sector:**

To increase investment for development and production of alternative for mineral fertilizers such as organic fertilizers, biofertilizers, as well as smart fertilizers including Slow-/Controlled-Release Fertilizers nano-fertilizers.
Thank you!