The South African fertiliser industry annually supplies about 2 million tons of fertiliser products (750 000 tons of N + P\textsubscript{2}O\textsubscript{5} + K\textsubscript{2}O) to the local market at a value of around R3 billion ($480 million). This represents approximately 20% of the South African chemical industry (excluding oil).

## SOUTH AFRICAN HISTORY

### EARLY HISTORY

Organic fertiliser was used at the Cape by Jan van Riebeeck. However, John Jourdain probably provided the first reference to the fertility of South African soils as early as 1608. After a few months at the Cape, he commented as follows on the Cape soils in his diary: "As alsoe if it were manured, I am of opinion that it would bear any thynge that should bee sown or planted in it." He also suggested that the Cape would be an ideal replenishing station for ships plying the route to India.

After arriving at the Cape in 1652, one of Jan van Riebeeck's first instructions was for Corporal Marcus Robbeljert, stationed on Robben Island, to clean the stables two to three times a week in order to supply manure for the gardens.

On 10 August 1652, Jan van Riebeeck recorded in his daily register that the soil near the castle was so fertile that seeds that had been washed away during a downpour germinated prolifically everywhere. During the first few months after his arrival, Van Riebeeck made several references in his daily register to the fertile state of the soil in the vicinity of the castle.

However, on 2 April 1655 he noted that the soil near the castle produced "weijnich vruchten" (few fruits) and that the soil higher up towards the mountain was more fertile. This latter soil was, however, difficult to cultivate owing to an abundance of roots ("overal vol crekelwortel"). Van Riebeeck was therefore faced with the problem that the economically viable soil was limited and its nutritional content was becoming depleted.

### Guano

This situation must obviously have deteriorated seriously in due course, since Van Riebeeck's successor, Commander Zacharias Wagenaar, in 1666 obtained the first shipload of guano for the Cape from Saldanha Bay.

Guano was therefore from the beginning a very important source of fertiliser and its role would increase in time.

The exploitation of guano from the Cape west coast started in the 1840s on the island of Ichaboe, and within one year the island was in chaos. Sailors murdered one another with picks and shovels for the privilege of loading guano. There was even a short-lived "Republic of Ichaboe" with a certain Ryan as president.

### Chemical fertilisers

As far as can be ascertained, the first time chemical fertiliser used in South Africa was in 1890. This was a small consignment of "corn and hay" fertiliser imported for a certain Van Heerden of Malmesbury.
The first local fertiliser factory dates back to 1903, when SAFCO initiated phosphate production from bones in Durban. The development of the mining industry in the early 20th century necessitated the production of explosives. This led to the founding of a viable fertiliser industry, initially based on sulphuric acid, which was a by-product, and imported rock phosphates. In 1919 and 1921 Kynoch, an explosives producer, and Cape Explosives (originally De Beers Explosives), respectively, started fertiliser production - Kynoch at Umbogintwini and Capex at Somerset West.

Several dry blending facilities were established as satellites of the coastal factories in due course. These dry blenders continued on a large scale to mix imported products with local products until import supplies dried up during the Second World War.

Price control was introduced as a war measure during the early 1940s and during the post World War II years, until the early eighties, the industry flourished in a protected trade environment and government support for agriculture in general. This led to the development of SASOL, ISCOR and FOSKOR in the early 1950s.

Development at Phalaborwa and Sasolburg was stimulated, resulting in new inland fertiliser production, namely factories of Fisons and Windmill at Sasolburg and Bosveld Fertilizer at Phalaborwa. By 1969 these three factories, together with a Fisons factory at Milnerton, became part of Fedmis.

The original Kynoch and Capex joined forces in 1924 as AE&CI, which later became African Explosives and Chemical Industries and at present AECI Limited. During this time other companies such as Omnia and Triomf started up.

The liberalisation of trade policies, abolishment of price control, and the opening-up of the South African economy that started around 1984, and which gained momentum during the 90s, led to large scale rationalisation and restructuring in the fertiliser industry.

Sasol Limited, which previously had been a supplier to other fertiliser manufacturers only, established its own fertiliser company (Sasol Fertilisers) and started marketing directly to farmers in 1984. Triomf and AECI separated their interests. Triomf kept the factories at Potchefstroom and Richards Bay, whilst AECI revived the name Kynoch Fertilizers with their factories at Somerset West, Umbogintwini and Modderfontein which they repossessed from Triomf. In 1986, Kynoch took over the local interests of Triomf. At about the same time an overseas consortium (Indian Ocean Fertilizer (Pty) Ltd, or IOF) took over the Richards Bay plant. IOF produced phosphoric acid and soluble phosphates mainly for the export market.

In 1988, the operational interests of Fedmis, a division of Sentrachem, were taken over by Sasol Fertilizers, Kynoch Fertilizers and Omnia Fertilizers. During 1990, Foskor became a shareholder in IOF. In 1992, Sasol Fertilizers decided to cease its direct marketing to farmers. In 1993, Kynoch Fertilizers took over the nitrogen interests of AECI. Chemfos (a subsidiary of Samancor), which mined rock phosphate at Langebaan and which was also a fertiliser blender, ceased its activities towards the end of 1993.

The years 1999/2004 were characterised by large-scale rationalisation and acquisitions in the industry. Foskor obtained the entire shareholding in IOF, resulting in the latter becoming a fully-owned subsidiary of Foskor. Norsk Hydro obtained the controlling interest in Kynoch, AECI’s fertiliser division. Sasol Fertilizers, who had been trading as Sasol Agri since 2000, obtained a 100% interest in the phosphoric acid producer Fedmis of Phalaborwa, which had been operated as a 50-50 joint venture by AECI-Kynoch and Sasol Fertilizers. Subsequent to this Sasol Agri was renamed Sasol Nitro and Kynoch became known as Yara SA.

**PRESENT POSITION**

The South African fertiliser industry of today is fully exposed to world market forces and operates in a totally deregulated environment with no import tariffs or government sponsored support measures.
**RAW MATERIAL PRODUCERS**
(Primary and intermediate raw materials)

**Nitrogen**
Sasol Limited supplies most of the country’s ammonia, with some also coming from Mittal Steel (previously called Iscor).

The restructuring of Kynoch (currently named Yara SA) in 2000 resulted in the AECI-Kynoch plants at Modderfontein and Milnerton being closed down. The result is that South Africa now imports all its urea. LAN is manufactured locally by Sasol Nitro and Omnia, while ammonium sulphate is produced by Sasol and Mittal Steel.

**Phosphates**
Foskor supplies phosphate concentrates to local and foreign fertiliser producers. Through treatment with sulphuric acid, phosphoric acid or nitric acid, the concentrate is converted into a whole range of intermediate (e.g. phosphoric acid and DAP) and downstream products (e.g. superphosphate). Sulphuric acid is a by-product of the gold mining industry but is also produced from imported and local sulphur (ex Sasol at Secunda). Sasol Agri, Omnia and Yara SA supply intermediate and final products to the market.

**Potassium**
All South Africa’s potassium requirements are imported.

South Africa’s current domestic fertiliser demand is around 760 000 tonnes plant nutrients (N + P₂O₅ + K₂O). This demand, as mentioned above, is met through local production and imports.

South Africa, through Foskor, is a significant exporter of phosphoric acid. Foskor’s Richards Bay plant has a current annual capacity of 725 000 tonnes of P₂O₅. As can be seen in Figure 1 the company is steadily approaching their nameplate capacity.

![Figure 1. Phosphoric acid production at Foskor Richards Bay Division 1990-2005](image)

**PRODUCERS OF DOWNSTREAM PRODUCTS**

Yara SA, Sasol Agri and Omnia have granular and bulk blending plants. All three also produce liquid fertilisers. Several blender companies use such granular products to supply dry bulk blended products, for example Atlas Organic Fertilizers, Nitrophoska, Plaaslike Boeredienste and Nitrochem.
DOMESTIC FERTILISER CONSUMPTION

Provinces of South Africa (Figure 2): Gauteng, Mpumalanga, Limpopo and North-West account for approximately 40% of total domestic fertiliser consumption, and the Free State, KwaZulu-Natal and the Western Cape for approximately 20% each.

Figure 2. Provinces of South Africa

Fertiliser consumption 1955 to 2005

Figure 3 shows very clearly the growth in fertiliser consumption in South Africa from 1955, reaching a peak of more than 3 million tons in 1982, when price control was in place and the industry operated in a protected trade environment.

Figure 3. Fertiliser consumption in South Africa 1955-2005
In 1982 the country suffered the most severe drought in two centuries. This coincided with the worst recession since 1930, which had a serious financial effect on both farmers and the fertiliser industry. The fall in fertiliser consumption can be clearly seen in Figure 3 and 4. Shortly after this, in 1984, the liberalisation of the South African trade policies started with the abolition of price control and the opening-up of the economy. Once everything settled down total fertiliser consumption levelled off in 1988 at around the 2 million ton per annum mark where it has stayed until 2004. Figure 4 shows also that after 1984 consumption of $P_2O_5$ declined quite severely and only started levelling off at around 200 000 tonnes per annum in 1990.

![Figure 4. Plant nutrient consumption in South Africa 1955-2005](image)

This obviously had a severe effect on Foskor, who was supplying 3 million tons of rock phosphate to the local market in 1982. The company started exporting rock and currently around 1 million tons of rock is sold in South Africa per annum, the other 1.7 million tons are converted to phosphoric acid for export.

**Local fertiliser consumption in relation to crop production**

Maize is estimated to be the largest single consumer of fertiliser, with almost 40% of the total fertiliser market, followed by sugar cane (15%) and wheat (10%). The other crops together represent approximately 35% of the total fertiliser market (see Figure 5 and Table 2).

**Price trends**

Fertiliser price trends are illustrated in Figure 6. The net fertiliser price in the figure reflects the weighted ex-factory / ex-importer fertiliser price per tonne of all fertiliser sold in South Africa, calculated on a quarterly basis.

Since the last quarter of 2004 the average price of fertiliser has been on the increase in harmony with the international increase in the price of Urea, DAP, Ammonia, Potassium and Sulphur.
Table 2. Fertiliser consumption by crop (in '000 of tonnes)

<table>
<thead>
<tr>
<th>Crops/groups</th>
<th>N</th>
<th>P₂O₅</th>
<th>K₂O</th>
<th>Total</th>
<th>Percent</th>
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<tbody>
<tr>
<td><strong>Field crops:</strong></td>
<td></td>
<td></td>
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<tr>
<td>Maize</td>
<td>175</td>
<td>73</td>
<td>17</td>
<td>265</td>
<td>41</td>
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<tr>
<td>Wheat</td>
<td>25</td>
<td>18</td>
<td>3</td>
<td>46</td>
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<td>8</td>
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<td>3</td>
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<tr>
<td>Soybeans</td>
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<td>&lt;1</td>
<td>2</td>
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<td>38</td>
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<td>Lucerne</td>
<td>2</td>
<td>10</td>
<td>4</td>
<td>16</td>
<td>2</td>
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<tr>
<td>Other Pastures</td>
<td>21</td>
<td>16</td>
<td>3</td>
<td>40</td>
<td>6</td>
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<tr>
<td>Sub Total</td>
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<td>153</td>
<td>82</td>
<td>505</td>
<td>78</td>
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<td><strong>Industrial crops:</strong></td>
<td></td>
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<tr>
<td>Tobacco</td>
<td>0.6</td>
<td>3</td>
<td>2</td>
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<td>Cotton</td>
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<td>1</td>
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<tr>
<td>Sub Total</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td><strong>Horticultural and fruit crops:</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Citrus</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
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<td>9</td>
<td>3</td>
<td>12</td>
<td>24</td>
<td>4</td>
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<td>Vines</td>
<td>8</td>
<td>5</td>
<td>4</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>Deciduous fruit</td>
<td>6</td>
<td>2</td>
<td>4</td>
<td>12</td>
<td>2</td>
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<tr>
<td>Vegetables</td>
<td>16</td>
<td>15</td>
<td>11</td>
<td>42</td>
<td>6</td>
</tr>
<tr>
<td>Potatoes</td>
<td>9</td>
<td>8</td>
<td>6</td>
<td>23</td>
<td>4</td>
</tr>
<tr>
<td>Sub Total</td>
<td>53</td>
<td>35</td>
<td>41</td>
<td>129</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>323</td>
<td>192</td>
<td>125</td>
<td>641</td>
<td>100</td>
</tr>
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</table>
GOVERNMENT CONTROL

All fertilisers, including bagged natural organic fertilisers, must be registered in terms of Act 36 of 1947. Registration commits the producer to the specified composition of the fertiliser. The Act is administered by the National Department of Agriculture, and the quality and composition of manufactured products are controlled by the Registrar of Fertilisers. At present there are more than 700 registered products. The fertiliser industry is also subject to factory, labour, transport and environmental legislation.

THE FERTILIZER SOCIETY OF SOUTH AFRICA

The Fertilizer Society of South Africa (FSSA) was established in 1959 as a section 21 non-profit company.

It is the representative body of the fertiliser and agricultural lime industries in South Africa. In 2005, membership numbered 15 companies, two of which were Zimbabwe owned and operated in Zimbabwe.

The Fertilizer Society actively pursues:

- the promotion of agro-economic and environmentally accountable fertilisation and liming practices;
- the promotion of a positive public awareness and acceptance of the necessity of fertilisers and agricultural lime in food production;
- the collection of, the addition of value to and the dissemination of relevant information concerning the fertiliser and agricultural lime market.
South Africa covers an area of 1,219,090 km² (4% of the total area of Africa) and has a population in the order of 44 million people. Sub-Saharan Africa (SSA) covers an area of 24,218,000 km², some 80% of the total area of Africa, and has a current population in the order of 600 million.

The population growth in SSA from 1950 to 2000 as well as the expected growth up to 2050 is depicted in Figure 7. It is expected that the current population will increase three-fold in the next 50 years.

![Figure 7. Population growth in sub-Saharan Africa](image)

The total NPK consumption in South Africa is in the order of 750,000 tons per annum. In sharp contrast with this, SSA, which covers an area roughly 24 times greater than that of South Africa and supports a population about 13 times more, only consumes around 1.2 million tons of NPK per year.

The average NPK application rate in SSA is in the order of 9 to 12 kg/ha while the cereal yield is on average 1 ton per hectare.

The SSA region is currently experiencing a problem with food security and all the previous data show that this problem will only intensify in future if nothing is done.

Many initiatives, much the same as in Asia and South America, were introduced in Africa to alleviate the chronic food shortage. As can be seen from Figure 8 these initiatives did not meet with much success and Africa is currently actually experiencing a decrease in the production of food per capita while Asia and South America are doing the opposite.

Soil fertility depletion on smallholder farms has been identified throughout SSA as the fundamental biophysical cause of declining per capita food production in this region.

Although Nepad introduced a fertiliser development program with the following main points of action:
• Implementation of soil fertility action plans;
• Establishment of national access to existing regional fertiliser markets;
• Improved efficiency of downstream markets;
• Establishment of financing for farmers.

![Percentage increase in food per capita since 1990](image)

**Figure 8. Percentage increase in food per capita since 1990**

There is still one element missing and this is the absence of effective policy dialogue in the whole SSA region. In other words, the region needs an established agricultural input regulatory system to:

• Protect the consumer;
• Be compatible with open markets;
• Promote regional and international trade.

**CONCLUSION**

South Africa has much to offer in terms of helping to establish regulatory systems in SSA.

With its very well established fertiliser industry that is currently operating far under its true capacity there exist a great challenge with helping to build up the soil fertility in the whole region.

Hopefully much better guidelines on how to affect the above will emerge from the African Fertiliser Summit which will be held in Nigeria in June 2006.

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