

1 We all need phosphate

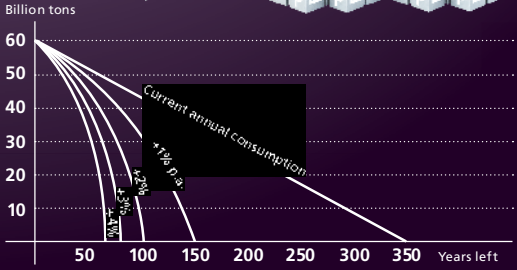
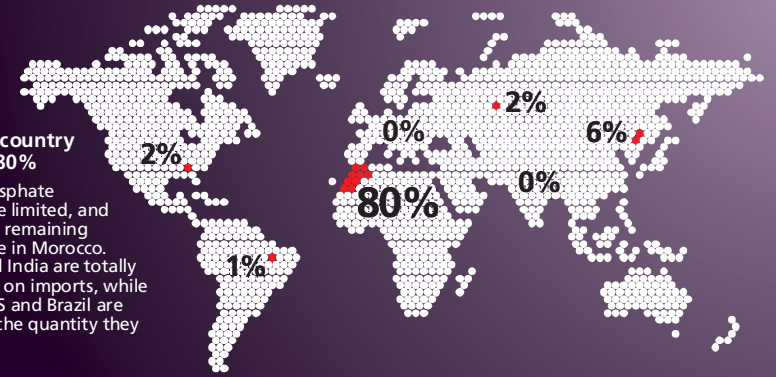
Phosphorus is an essential building block and energy carrier. It cannot be substituted or manufactured – only mined.

Facts about phosphate

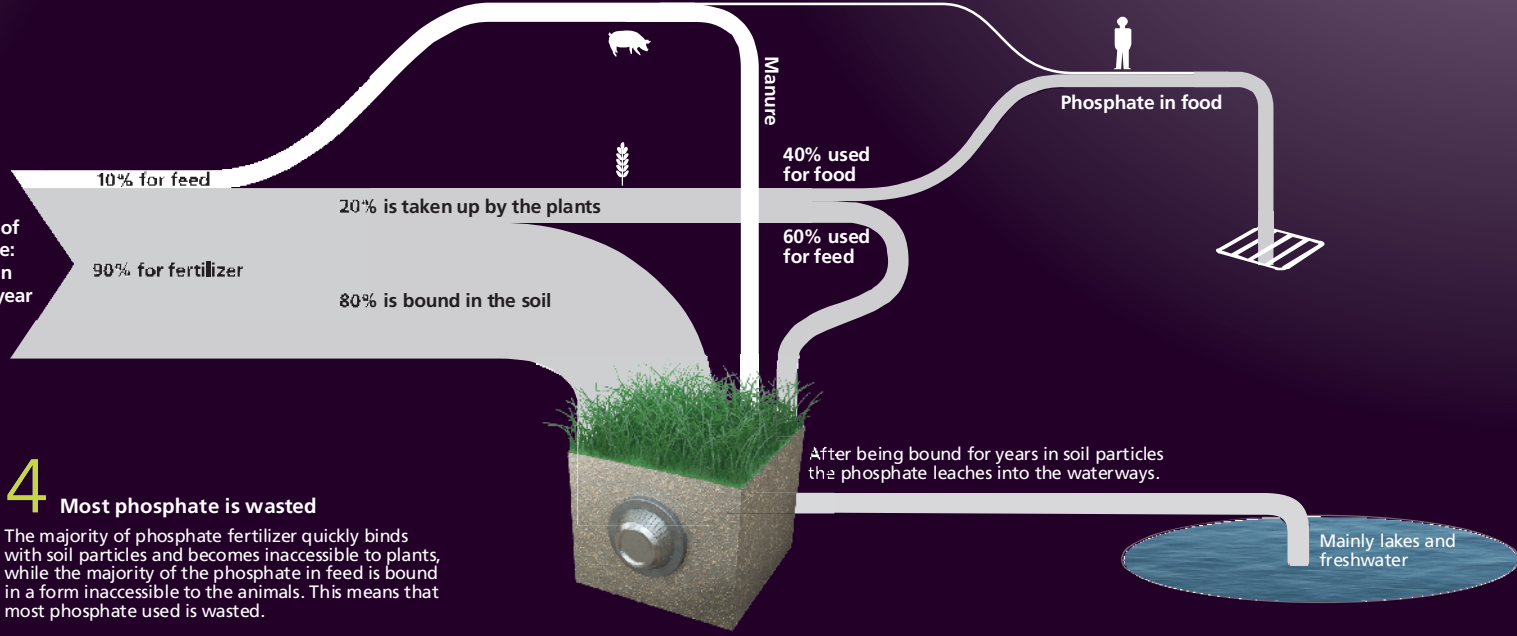
Phosphate is an indispensable resource for global agriculture. Phosphate shortage could be one of the most pressing problems of future food supply

2 One country has 80%

Global phosphate reserves are limited, and 80% of the remaining reserves are in Morocco. Europe and India are totally dependent on imports, while both the US and Brazil are increasing the quantity they import.



Total use of phosphate: 170 million tons per year



3 Phosphate shortage could accelerate

At the current rate of consumption, the global phosphate reserves of 60 billion tons could last 350 years. However, the fertilizer industry predicts the current annual consumption increase of 4% will continue – and that would significantly reduce the years left and increase prices.

4 Most phosphate is wasted

The majority of phosphate fertilizer quickly binds with soil particles and becomes inaccessible to plants, while the majority of the phosphate in feed is bound in a form inaccessible to the animals. This means that most phosphate used is wasted.

SOLUTIONS

We need to start using the phosphate resource **more efficiently** and design a future agriculture that **reduces and recycles** the phosphate used.



Up to 40% phosphate saved in crop production

Farmers can use fungi (phosphate-solubilizing inoculants) with their fertilizer. The fungi multiply along the plant roots and unlock the phosphate bound in the soil. This allows more phosphate to reach the roots, increasing yields while using up to 40% less phosphate. By doing this the farmer can also reduce the risk of phosphate leaching into the waterways.



25–100% phosphate saved in animal production

Farmers can add enzymes (phytase) to their feed mix. The enzymes will unlock the majority of the phosphate bound in the feed unavailable to the animals. This will allow the animal to take up more phosphate from the plants and reduce the need for added phosphate with by 25–100%. By doing this the farmer can also reduce the amount of phosphate that is released into the environment in the manure.

100% manure phosphate recycled

Manure is often applied at excessive rates and is produced in concentrated areas far away from crop growers. Just as fertilizer phosphate quickly binds with soil particles, manure phosphate is also bound in a form inaccessible to crops. The phosphate in manure can be far better utilized if processed into biogas. The solid by-product would be concentrated phosphate pills, which are transportable and doseable with plant-available phosphate.

