

Phosphate, stewardship of an irreplaceable and finite resource

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Phosphate – P Stewardship

- P is critical to many physiological and biochemical processes.
- Its most likely the most multifunctional mineral element.
- There is no substitute.
- It is a finite resource.
- Sustainability and Stewardship.

Current Global Situation – Market today

- Annual global market is some 20-25 mio tons of inorganic P.
- A period of slow/no growth, now need of P is escalating mainly due to global grain situation.
- Globally, demand is driven by food needs and today also biofuel production (change).
- Prices have 8-10 doubled since 2005 and up to doubled since Dec 2007 depending on product "sophistication".
- Supply/Demand switch

Current Global Situation – Consumption

- Major use is as mineral fertilisers ~80-85%, detergents ~5%, inorganic feed phosphates ~5-10% and industrial applications ~5%.
- The majority (>99%) of the inorganic P is mined.
- Less than one percent is recovered.
- Significant volumes are recycled, the major share being animal manures.
- Other wastes far from being fully utilised.

Current Global Situation – Consumption

- How long will the P reserves/Resources last?
- It depends.....
- Depends on economics, infrastructure and technical conditions.
- Depends on consumption and management.
- High quality reserves are being depleted faster.
- 100-150 years up to some 500-600 years based on currently known resources, current technology and current accepted extraction cost.

Europe – P Flow/Balance

- Europe (EU 27) is the world's single largest exporter and importer of agricultural produce.
- EU has almost 500 mio population, ~7.5% of the global population.
- Today EU has
 - 20 % of world pig production,
 - 20 % of world egg production,
 - 10 % of world chicken production,
 - 10 % of world cattle production.

Europe – P Flow/Balance

- EU imports the major part of its mineral P requirements.
- Current use is approx 1,500 kt of P in mineral fertiliser, 250 kt of P in inorganic feed supplements, 100-125 kt P in detergents and some 25-50 kt P in food additives, some 10 kt P for water treatment etc.
- EU imports also significant quantities of organic P in food (? Kt) and feed (250 kt).
- Export?

Europe – P for Recycling/Recovery

- Animal manures ~2,500 kt P
- Human excreta ~275 kt P (not all to WWT)
 - sewage sludge ~400 kt P (potentially, with the UWWT Directive fully implemented)
- Food processing waste
 - abattoirs ~130 kt P
 - other food industries (? kt)
- Mining residues (mining waste, desposited)
 - e.g. 100 kt P i Swedish annual iron ore processing
 - gypsum waste from phosphoric acid production
- Other

The Issue - Solutions

- Improve efficiency of P used.
- Tighten the overall P cycle.
- Simple principles; minimise input and maximise output, i.e. introduce a P diet/regime for the society and thus change from "insurance/savings behaviour".
- EU principle Reuse-Recycle-Recover.
- Make better use of the knowledge we have.
- Invest

Tightening - Agriculture

- Manure P reflects efficiency of P use in animal production.
- Estimate of P in manure in Europe - 2.5 Mt.
- By implementing the easiest parts of best nutrient management practices it could be reduced to - 1.9 Mt.
- Improved distribution/management of manure and sewage sludge reduces the needs of mineral P fertiliser.
- Implement best nutrient management practices.

Tightening - Society

- Ensure best wwt practices.
- Use sewage sludge as a resource.
- Recover P if not recycling in agriculture is feasible.

Remarks

- It is justified to require that the involved players strive for;
 - Finding common grounds and sharing the issues and solutions,
 - Cross-sector and multi-disciplinary co-operation and development,
 - Employing Best Practices.