

BIOCHEM show case

A long-term application test for plant-based lubricants in hydraulic systems for heavy plant machinery used in constructing the next phase of the Eden Project

Problem

Most lubricants are mineral oil based with specialists lubes made synthetically. Plant-based lubricants are available and widely used in some applications. Around 90% of lubricants currently used could be replaced by plant-derived chemicals. The major barrier to the widespread use of plant-based lubricants is cost, however with rising oil prices they are becoming more competitive.

Technical solution

At the Eden Project in Cornwall, the UK's largest biolubricant manufacturer, Fuchs worked with McAlpine, Highway Plant and the National Non-Food Crops Centre to test plant-derived lubricants for hydraulic systems, engines bearing greases and transmission fluids. Excavation at the site (the Eden Project is in Europe's largest china clay pit) involved invasive and destructive minerals. Performance was monitored over a two year period and compared with mineral oil used in similar applications at the same site. The condition of the oils following this period was exceptional: metal wear was found to be one tenth of that expected from mineral oils. This demonstrated longer lifespan could provide savings that outweigh the increased purchase price of the lubricants themselves.

Benefits

Advantages of plant-based lubricants:

- Reduced pollution (groundwater/soil/food)

- **Smaller carbon footprint**
- **Biodegradable**
- **Low toxicity**
- **Excellent lubricity (lower friction coefficients than mineral oils)**
- **Lower evaporation: up to 20% less than mineral oils**
- **Higher flashpoint**
- **Higher viscosity indices**
- **Enhanced performance in some applications**

Additional information

Fuchs website

<http://www.fuchslubricants.com/>

National Non-Food Crops Centre

<http://www.nfccc.co.uk/>