



Realising the Economic Potential of Sustainable Resources Bioproducts from Non-Food Crops

Using plant oils as lubricants

Background on plant-derived lubricants:

Lubricants are used to reduce friction and wear, protect metal surfaces against corrosion, distribute heat, remove contaminants and absorb shocks.

Different types of plant oils show many desirable lubricant properties such as good lubricity, wear protection, stable characteristics under a range of temperatures and low evaporation.

Plant oils are currently used as lubricants in the form of:

- additives in synthetic oils
- transmission fluids
- motor and chain oils
- hydraulic oils
- greases

Biolubricants are already widely used in environmentally-sensitive situations such as forestry and marine applications where loss of the lubricant occurs.

What are the benefits or advantages associated with the development and use of plant-derived lubricants?

Plants offer the potential for low cost production of alternatives to oils, waxes and greases currently derived from the petrochemical industry. Development of non-food oil crop systems to produce useful oils for transport, industry and consumers will secure a supply of renewable, sustainable materials for society.

Plant-derived lubricants are biodegradable and non-toxic, which means that in the case of spills or leaks, they are less damaging to the environment than petroleum-based products.

What are the issues associated with the development and use of plant-derived lubricants?

The development of new plant-oil lubricants will require the creation of new industries (extractors, refiners and blenders), supply chains and markets. Products must be able to compete in terms of performance and also economically with the products they are replacing, or demonstrate functionality if the lubricant has novel uses. Political support will be essential to support oil crop agriculture and market acceptance of plant oil products.

How does the performance of plant oils as lubricants compare with petroleum-derived lubricants?

Currently, the properties of some plant oils affect their suitability for different applications. For example, some plant oils can outperform mineral oils in providing lubrication but do not perform as well in other areas, having poor stability, reduced performance under low temperatures or decreased lifespan. Chemically altering the structure of the plant oils and blending different oils together can counteract these drawbacks. For example, plant oils can be chemically modified to produce wax esters which perform well as lubricants and are much more resistant to degradation.

For more information on the Plant Oils theme, please visit the EPOBIO website at: www.epobio.net