

University of Northern Iowa's
Ag-Based Industrial Lubricants
(ABIL) Research Program
March 6, 2002

SPECIFIC REQUEST:

- To date, funds provided to ABIL have been utilized at applied, developmental and demonstrations stages. *The focus of this request will direct funding toward marketing and advocacy initiatives.*

ABIL DESCRIPTION:

- Established in 1991 as a non-profit entity specializing in the research and development of innovative, industrial soy technologies.
- Recognized nationally as a biobased center of excellence with a reputation proving we are able to provide unique expertise toward crop-based industrial lubricants.
- *ABIL's specific goal for FY 2002 focuses on market acceptance initiatives for our product portfolio.*

ABIL CLIENTS:

- Private industry, governmental agencies, educational institutions and societal organizations.

ACCOMPLISHMENTS:

Over 10 years of applied R&D have:

- Proven that soy-based formulations are feasible, offer specific performance advantages, provide unique energy efficiency opportunities and improved environmental and health and safety advantages.
- Shown soy-based products are price competitive with their petroleum counterparts.
- Resulted in the development of 12 industrial soy products and four base oils, each licensed to market.

SOY OIL PRODUCTS:

- Soy industrial fluids: industrial, tractor, cold-temperature and food grade hydraulic fluids, gear lubricants, dielectric transformer fluids, metalworking fluids and a variety of wood preservative products. *Note: several product categories include multiple formulations to address specific operating environments.*
- Soy industrial greases: truck, rail, cotton picker spindle and food machinery lubricating greases. *Note: several product categories include multiple formulations to address specific operating environments.*

IMPACT:

- **Truck Grease** – product(s) have been field-tested and are licensed to West Central Cooperative; one of the **key products** to be introduced nationwide under a market acceptance initiative; *the goal is to capture ½ of the 17 million pound US market in five years.* Newer formulations are competitively priced (as compared to petroleum counterparts). End-user: Crete Carrier Corporation.
- **Rail Grease** – products have been field-tested and are licensed to ELM Inc.; one of the **key products** to be introduced nationwide under a market acceptance initiative; *the goal is to capture ½ of the 9 million pound US market in five years.* Competitive pricing (as compared to

petroleum). End-users include: Amtrak, Iowa Interstate Railroad (IIRR), Bay Area Rapid Transit (BART), Dallas Area Rapid Transit (DART), Tri-Met, and Norfolk Southern (contract pending).

- **Universal Tractor Hydraulic Oil** – products have been field-tested and are licensed to West Central Cooperative. To date, products have sold in smaller quantities to end-users such as Iowa Department of Transportation, Sandia National Laboratories and federal agencies. The main hindrance to market acceptance is higher costs (2-3 times that of petroleum) and lack of regulatory relief for users of biobased products from EPA and/or DNR.
- **Metalworking Fluids** – products include metal cutting, forming and cooling fluids currently being field tested cooperatively at eight progressive tool and die shops. Products present unique value-adding opportunities, as they are price competitive. As a whole metalworking fluids command higher price points. Key benefits include performance, health and safety advantages, increased production capacity and extended tool life. ABIL anticipates market impact within the next two years.
- **Dielectric Fluids** – products have been jointly patented with Waverly Light & Power, totaling six patents to date. WL&P has been assigned product marketing rights. Products represent *one of the largest single use fluids* in the ABIL product portfolio *with a 4.5 billion US market, replacement oil is estimated at 150 million gallons/year*. End-users include Nebraska Public Power, Tennessee Valley Authority, and WL&P.

EXPLORING NEW TECHNOLOGIES:

- In 2000 the USDA awarded ABIL a special grant for value-added production processes, specifically to demonstrate and implement on-the-farm, crop-based grease production. The project involves the creation of pilot production plants to establish grease-processing procedures, capacities, and capital requirements. This approach allows farmer-processors more control and increased marketing opportunities.
- Continuously striving to improve product formulations (base oils and additives), manufacturing processes and packaging.

SIGNIFICANT OUTCOMES PROJECTED:

- Annual U.S. market for industrial fluids is estimated at 1.1 billion gallons (National Petrochemical Refiners' Association).
- ABIL's efforts will create new-use markets - conservatively estimated, converting 10% of the industrial lubricants market would require approximately 110 million gallons of oil per year, utilizing 2.6 million acres of both commodity and genetically modified soybeans. [110 million gallons x \$8 = \$880 million].
- Increasing demand for non-food markets will assist with the stabilization of soy prices.

CREATION OF A MARKET:

- The marketing program involves the participation of Iowa's state agencies and key industry leaders, as well as the continued advocacy efforts of the ABIL program.
- State agencies and growers' associations will be encouraged to cooperatively promote an overall industry developed from soybean oil – “soy *industrial* products” and their related benefits, thereby providing national exposure and continuing education of the public of the many products derived from soy, i.e., inks, diesel, candles, industrial lubes and greases.
- Two major firms are being prepared to utilize (ABIL developed) soy oil-based greases. Each entity is a key market leader and trendsetter within the rail and trucking industries, respectively, and is committed to supporting a “green” program. The objective is to have these industry leaders approve, adopt and endorse the use of soy industrial greases.
- The UNI-ABIL Research Program will continue to provide indirect marketing support via technical support, political activities, and educational and advocacy initiatives (includes: technical

services and support, training, establishment of new standards, certification and labeling guidelines for biobased products, and evaluation and qualification of biobased products).

FUNDING SOURCES:

ABIL's annual operating budget is approximately \$700,000 derived from a variety of sources to include federal, state, grant and private funding, as well as fee-based services. Of that, state funding comprises approximately 37% of the annual budget, with 48% from federal sources and 15% from other funding and fee-based services respectively.

- *Iowa Department of Economic Development (IDED): Ag-Based Industrial Lubricants Program*. Program funded for \$258,500, July 2001 – June 2002.

In summary, state funding is leveraged at an approximate ratio of 2:1.

OTHER FUNDING SOURCES:

- *USDA – Cooperative State Research, Education, and Extension Service: Ag-Based Industrial Lubricants Research Program*. Program funded for \$336,960, February 2002 – January 2003.
- *Iowa Soybean Association (ISA): Ag-Based Industrial Lubricants Research Program*. Program funded for \$25,000, October 2001 – September 2002.
- Submitted to the *National Lubricating Grease Institute (NLGI): Comparative Analysis of Soybean Based Greases*. Program request: \$35,000.