

Did You Know?



Soybeans.

Lady Liberty is now green inside and out. ARS researchers at the National Center for Agricultural Utilization Research in Peoria, IL, developed a biodegradable hydraulic fluid made from soybean oil, which now powers the Statue of Liberty's elevator. Prior to this USDA-ARS invention, the Statue's elevator

used mineral oil formulations derived from petroleum. However, the National Park Service (NPS), which manages both Liberty Island and Ellis Island in New York, decided to “go green,” using products made from renewable sources that are less polluting. NPS contacted ARS about developing a biobased fluid for powering the Statue's elevator. NPS wanted a product that was environmentally friendly, came from a renewable resource, was economical and nonpolluting, and met all industry standards for safety and performance, such as for viscosity, stability and flame resistance.

ARS researchers already had the know-how and equipment to develop this technology. The researchers had previous success developing commercial soy-based hydraulic fluids and oils. Though other vegetable oils will work, soy oil was chosen because of its low cost, chemical versatility and availability as a renewable, homegrown resource. Soy is the nation's leading source of food-grade oil, yet only 517 million pounds—3 percent of the total supply—are used for industrial purposes. Thanks to this discovery, soy-based hydraulic fluids now power other industrial equipment and machinery nationwide.

Agri-Lube, Inc. (Defiance, OH), a firm collaborating with ARS, scaled up production of the final biobased formula for testing—first for Otis Elevator Company, Farmington, CT—using 50 gallons, then for NPS at Liberty Island using 1,000 gallons. Agri-Lube, later joined by Bunge Oils headquartered in St. Louis, MO, has exclusively licensed the rights to commercialize USDA-ARS patents on the hydraulic fluid and two vegetable-oil-based printing inks.

Innovations like these should spawn new markets for soy and other oilseed crops, while easing the nation's dependence on petroleum, and the resulting burden on the environment.



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