



# Ohio State HCS News

HORTICULTURE & CROP SCIENCE IN VIRTUAL PERSPECTIVE - THE OHIO STATE UNIVERSITY

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## H&CS and Battelle Partner on Soybean Oil Development



H&CS researchers deliver samples of soybean oil from OARDC developed germplasm to the Battelle laboratory.

Americans are on intimate terms with soybean oil, consuming it daily in food products ranging from french fries to granola bars, and margarine to mayonnaise. Many consumers are also familiar with the use of soy oil in biodiesel fuels and in printing ink. Potentially soy oil can be used for many more industrial products that are currently being made from petroleum.

A new partnership between Battelle and Ohio State brings together considerable expertise to investigate soy oil potential. Soybean breeders from OSU's Horticulture & Crop Science program (H&CS) and oil chemists from the [Battelle Memorial Institute](#) are collaborating to develop some new products, including soy-based lubricants, plasticizers, and polyols.

The first step toward developing new soy oil products is identifying the ideal fatty acid composition. Although soybean breeders can change the proportions of the saturated and unsaturated fatty acids that occur in soybean oil, oil chemists have not previously scrutinized the value of these changes in the context of industrial products.



Soybean oil from Ohio State developed germplasm will be evaluated for use in making biodiesel and specialty chemicals.

H&CS Professor **Steve St. Martin** and the Ohio Agricultural Research and Development Center (OARDC) Soybean Breeding Program is responsible for providing oil from soybean germplasm with different fatty acid compositions to Battelle's oil chemists. The Battelle bioproducts team of **Herman Benecke, Dan Garbark, Jeff Cafmeyer, and Barry McGraw** is aiming to identify ideal combinations of fatty acids. Battelle received the first four oil samples from Dr. St. Martin in March 2007 and have begun the chemical

analysis. He plans to deliver another set of samples after the autumn harvest.

Building on the feedback from Battelle's chemists, St. Martin and H&CS soybean researchers **Marcia Feller, Scott McIntyre, and Andy Spring** will develop new soybean varieties that combine the modified composition with high yield, disease resistance, and adaptability to Ohio.

"Battelle's oil chemists have been successful in developing numerous soy-based products, including most recently a toner for printer cartridges. Soy oil would be a better raw material if its fatty acid composition were changed somewhat," explains St. Martin. "These changes can be made genetically. The OARDC Soybean Breeding Program is working on developing varieties with high yield and disease resistance, but now with incorporation of genes for modified fatty acid profile."



The Battelle team of Herman Benecke, Jeff Cafmeyer, Dan Garbark, and Barry McGraw is identifying ideal combinations of fatty acids in soybean oils.

St. Martin is optimistic about the potential of finding the right soybean variety for the job. However, he cautions, "No modified-oil variety will be successful unless it yields well in Ohio and is resistant to prevalent diseases."

The change in oil composition will not affect uses of the oil in food notes St. Martin. "Some of the same modifications are now being introduced for the food uses of soy oil, i.e., low linolenic acid and reduced levels of saturated fat.

This project is funded by checkoff dollars through the Ohio Soybean Council and supported by the [Ohio BioProducts Innovation Center](#) (OBIC).

"OBIC has provided us with additional staff and equipment to expand our research. Specifically, we have two new plot combines, with trucks and trailers to haul them. OBIC also made a sizeable investment in equipment and staff at the [Molecular and Cellular Imaging Center](#) (MCIC), including the addition of Genomics Manager **Tarek Joobeur**. These facilities enable us to use molecular markers to streamline the process of identifying experimental lines that have desired genes for oil quality and disease resistance. OBIC's investment shifts the odds of finding such a combination in our favor," said St. Martin.