SUMMARY FACT SHEET
Liquid Soybean-Derived Fertilizers for Horticulture and Controlled Environment Agriculture

How did this project start?

> Minnesota Soybean Research and Promotion Council (MSR&PC) partnered with the Agricultural Utilization Research Institute (AURI) to assess soy-derived liquid fertilizers in horticulture and controlled environment agriculture (CEA). The work focused on performance, practicality, and commercialization pathways.
> Demonstrations took place of three liquid fertilizer formulations by project partners, Nature's Source, Sherman, Texas (https://www.naturessourceplantfood.com/contact-NS), and Ferticell, Tempe, Arizona (https://www.ferticellusa.com):
- Nature's Source 10-4-3 and 10-4-5: Contains 0.5-1.0 bushel of soybeans per gallon and is made with natural soybean oilseed extract (soapstock).
- Ferticell 5-10-10: Uses natural soy protein isolate from two bushels of soybeans per gallon of fertilizer.

Key Features of Soy-Derived Liquid Fertilizers and Demonstration Outcomes

> Formulations are well-suited for use in horticulture and controlled environment agriculture.
> High in nitrogen for an organic liquid fertilizer; naturally slow release.
> Rich in amino acids, which act as growth stimulants for roots and leaves.
> Both product lines feature very low salt concentrations, which support improved plant health, reduced stress, and enhanced soil structure. Safe for young seedlings.
> Demonstrations were held at the University of Minnesota West Central Research & Outreach Center in Morris, MN; Riverside Farms in Elk River, MN; and the Green Barn Garden Center in Isanti, MN.

> "*These fertilizers were used for ornamental plants, including several flower varieties. I would like to continue using this each spring in the greenhouse growing season.*" (Horticulturist, Ella VanKempen, UMN West Central Research & Outreach Center)

Recommendations

> Formulation and performance optimization to refine nutrient balance, viscosity, and storage stability.
> Demonstration expansion with clear nutrient equivalency guidance and injector set-ups to ease adoption.
> Evaluation of Minnesota-based blending/concentration capacity to cut freight and scale distribution.

Future Opportunities for Minnesota Soybean Meal/Derivatives Look Promising

> Minnesota's early adopter market remains modest but is expanding, with growing national interest pointing to wider opportunities ahead.
> Using Minnesota-grown soybeans in the production of liquid fertilizer offers considerable growth opportunities, particularly when soy-derived coproducts are sourced or manufactured within the state. This approach can drive job creation, foster economic development, and facilitate increased market access both within Minnesota and beyond its borders.

Competitive Advantage

> Soy-derived fertilizers are competitive with other products in their class.

Learn More

> Listen to the *Turning Soy into Liquid Fertilizer* episode at **auri.org/ag-innovation-news-podcast**.
> Full report available at **auri.org/other-soy-related-resources/**.

A collaborative initiative of the
Minnesota Soybean Research & Promotion Council (MSR&PC) and AURI