Why Camelina sativa L. (camelina)?
- It grows well in Montana and prairie regions of U.S. and Canada.
- It is a low-input crop.
- It is an attractive rotational crop to wheat.
- It has a distinct fatty acid profile and has high protein content.
- It is potential feedstock for various biorefineries.

Advanced Fuel Production from Camelina Oil

Commercial aircraft utilizes jet fuel for gas-turbine engines or aviation gasoline (avgas) for piston engines.
- Alternative jet fuel production is achieved via synthetic paraffinic kerosene (SPK) pathway, the only method certified by the ASTM.
- No ASTM-approved method for renewable arags production.
- Advanced fuels = biojet fuels, renewable avgas, green diesel.
- Although advanced fuels are non-oxidized and have carbon chain lengths similar to petroleum, they have low aromatic content. Aromatic compounds provide desired lubricity and seal-swelling properties.
- Despite their high aromatic contents, they have low cetane numbers.

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Geospatial Analysis. Land availability was determined using ArcGIS analysis and MS Access SQL query tables. Wheat crop data, solar radiation, monthly temperature, and monthly precipitation was brought into ArcGIS and attributed to the land availability database. The resulting query tables were then imported back into ArcGIS using the database primary key to produce potential camelina land availability map.

Life Cycle Assessment (LCA) and Technoeconomic Analysis (TEA).
- A functional unit of 100,000 m³ fuel/yr (175,000 ha) was considered. The table is "on the pump".
- Compared to HRJ/HEFA and PTJ.

Techno-economic implications
- Significant increase in profitability using OMT-based advanced fuels.
- Although OMT’s main product on an energy value is much lower than HRJ, its total revenue (including co-products) is higher by 28%.
- To have profit, camelina yield ≥ 1.2 tons/ha/yr.

Results

Techno-economic Implications
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Conclusions:
- Metabolism-based (OMT) fossil-energy use and GHG emissions is 10% and 14% lower than the HEFA’s hydroprocessed renewable jet (HRJ), respectively.
- Geospatial analysis suggests that with respect to the four top wheat-producing states (KS, TX, MT, WA), representing a conservative annual national camelina yield at the "best-case" farming scenario (camelina only, 3-year follow), <1% total available land will be utilized. Profitability of OMT3 (biojet fuel route 2) is 3x higher than HRJ.