Sept. 22, 2011
News Release

Ag-West Bio leads Saskatchewan study to evaluate feasibility of developing crops and processing for bio-jet fuels

Saskatoon,SK: With the aviation industry looking for sustainable fuel alternatives, the development of bio-jet fuels appears to hold great potential for Saskatchewan, a province known for its high-quality oilseed production. Ag-West Bio Inc. is leading a study to determine the economic feasibility of developing this industry in Saskatchewan.

The two crops showing the most promise are *Camelina sativa* (camelina) and *Brassica carinata* (carinata). Based on these crops, three key commercial activities critical for developing a sustainable business will be evaluated:

1. Production of dedicated industrial oilseed crops – camelina and carinata.
2. Crushing and processing of camelina and carinata oils to produce "Drop-In" bio-based jet fuel.
   ** Drop-in fuel means the specifications of the bio-based jet fuel are the same as petroleum based jet fuel and no special storage or handling is required. This is a key requirement of the airline industry.*
3. Seamless logistics and infrastructure for the end-use commercial customer.

The project will determine the potential benefit to producers, opportunities for accompanying processing and refining businesses, and for Saskatchewan's economy. It is critical that the feasibility of this opportunity be confirmed early in order to map out the best path forward in developing this emerging industry.

"Mustard producers have invested research money into the development of carinata as a cropping option, but we need to know that the crop can be profitable for producers as well as all segments of the value chain," says Kevin Hursh, executive director of the Saskatchewan Mustard Development Commission.

The bio-based jet fuel industry is a very specialized field and Ag-West Bio will use external service providers with expertise in each of the critical activities who will interview users, industry experts and customers, and assess research information to complete the three components of the feasibility report.

"Ag-West Bio is pleased to lead this important and timely study to assess the opportunity aviation biofuel from industrial oilseeds may provide for Saskatchewan. We look forward to working with stakeholders, project participants and other interested parties over the coming months," says Mike Cey, VP Corporate & Business Development for Ag-West Bio and the project leader.

Ag-West Bio has established a Steering Committee that comprises Mustard 21 Canada Inc., Agrisoma Biosciences Inc., WestJet, Agriculture & Agri-Food Canada, the Saskatchewan Mustard Development Commission and Enterprise Saskatchewan. This committee will endeavor to understand the economics, logistics, the challenges and opportunities for production of these dedicated industrial oilseed crops, through to processing and commercial use of Drop-In bio-based jet fuel.

This project is made possible thanks to Agriculture & Agri-Food Canada's CAAP (Canadian Agricultural Adaptation Program) funding, administered through ACS (Agriculture Council of Saskatchewan).

Ag-West Bio would like to invite others who may be interested in furthering this work to come forward.

For more information, please contact:

Mike Cey (P.Ag.)
Vice President Corporate and Business Development
Ag-West Bio Inc.
T: (306) 668-2654
mike.cey@agwest.sk.ca

Backgrounder:

The world's jet fuel consumption (excluding military) is in excess of 319 billion litres and growing annually. The International Air Transport Association (IATA), along with numerous airlines around the world, has stated they have a goal to be "carbon neutral" by the year 2020. This will certainly require the addition of bio-based jet fuel to the mix in order to reach that goal. The ASTM (the American Society for Testing Materials) is the organization responsible for approving fuel specifications worldwide. In July 2011 the ASTM approved the use of up to a 50% blend of biofuels (ASTM D7566). This has the potential to translate into over four billion litres of bio based jet fuel in production worldwide by the year 2020.

The implementation of these global, renewable jet-fuel strategies translates into an enormous opportunity for bio-based jet fuel and in particular, for the Saskatchewan oilseed sector to supply, process and refine feedstock for these fuels. The two crops showing the most promise are *Camelina sativa* (camelina) and *Brassica carinata* (carinata).

Globally, there is no single bio-based feedstock source that will satisfy this huge renewable jet-fuel market requirement. There are multiple biomass feedstock options under consideration; one includes the use of present food grade oils from canola, soy, palm, safflower, as well as animal fats and waste oils from the food processing industry. However, non-food crops are preferable, such as *Brassica carinata*, *Camelina sativa*, crambe, algae and jatropha. Multiple sources of feedstock will be needed globally to supply renewable jet fuels. The most likely scenario is a small number of validated oil crops as one type of biomass feedstock. Currently, camelina is the most tested industrial oil for jet fuel feedstock in the world.

The aviation sector will need to rely on "drop-in" fuels that mesh seamlessly with existing supply and distribution networks. Currently, the most widely used process to make fuels from renewable oil sources is hydrotreating the oils to produce "Drop-in Hydrotreated Renewable Jet-fuel" or HRJ. This process uses natural oils and fats and a deoxygenation process, followed by hydrocracking and isomerization to produce a renewable Synthetic Paraffinic Kerosene (SPK) jet fuel. Other processes for making bio-based jet fuel from industrial oilseeds are also under development, along with biomass-based Fischer-Tropsch (FT) and catalytic approaches.

To date, no specific feasibility study has been undertaken in Saskatchewan to understand the business opportunity for the production and manufacturing of aviation bio-based jet fuel from dedicated industrial oilseed. In Canada there is significant industry interest from SMEs such as Agrisoma Biosciences, investing to develop dedicated industrial oilseed crops for the Drop-In bio-based jet fuel opportunity, and Linnaeus Plant Sciences, developing other high-value products to establish a sustainable business in Saskatchewan.