

Work on canola using synchrotron light

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Recently, scientists at AAFC have used synchrotron facilities to examine oilseeds. Synchrotrons produce extremely bright light and, as a result, are able to perform analyses that are not possible using conventional light sources. For example, synchrotron light may be used to produce infra-red absorption maps of samples at speeds, spatial resolutions and signal:noise ratios not possible using conventional infrared microscopes. As infra-red absorption spectra provide information about the chemical composition of a sample at a particular spot, the distribution of protein, carbohydrate or other substances may be elucidated. Researchers at AAFC have also used synchrotron-based X-ray fluorescence to determine relative metal concentrations and distributions in single, intact seeds of the model oilseed *Arabidopsis thaliana*. In addition, a new X-ray imaging technique called Diffraction Enhanced Imaging, which is only possible at a synchrotron, has been used to non-destructively examine canola seed anatomy and structural changes occurring in living seeds during germination. Although the work to date has been performed at facilities in the USA, Canadian researchers now have the opportunity to obtain unique synchrotron-based experimental data about canola by using the Canadian Light Source, which opened recently in Saskatoon, Saskatchewan.