

Success stories

  <p>THE BRIGHTEST LIGHT IN CANADIAN AG RESEARCH</p> <p>CANADIAN LIGHT SOURCE SYNCHROTRON ILLUMINATES SCIENTIFIC SECRETS FROM SOIL TO SANDWICHES</p> <p>SEPTEMBER 11, 2020 • TOMMY WILSON • NO COMMENTS</p> <p>BY TAMARA LEIGH • PHOTOS COURTESY OF CANADIAN LIGHT SOURCE</p>  <p>SYNCHROTRON X-RAYS ARE VERY SENSITIVE TO SMALL DENSITY DIFFERENCES IN SOFT TISSUES SUCH AS LIVING WHEAT HEADS, PICTURED ABOVE, MAKING THE SYSTEM VERY USEFUL FOR AGRICULTURAL APPLICATIONS.</p> <p>THE BRIGHTEST LIGHT IN CANADIAN AG RESEARCH</p> <p>https://grainswest.com/2020/09/the-brightest-light-in-canadian-ag-research/</p>	 <p>Growing an international agricultural syn</p> <p>Dr. Chithra Karunakaran's passion for ag helped her to grow an international ag</p> <p>By COLLEGE</p> <p>Dr. Chithra Karunakaran preparing a</p> <p>Karunakaran helping scientists to analyse chickpeas at the CLS</p> <p>Growing an international community</p> <p>https://www.lightsource.ca/public/news/2019-20-q4-jasynchrotron-research.php</p>
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- 2019 – Developing more nutritious crops to feed a growing world https://www.lightsource.ca/news/details/developing_more_nutritious_crops_to_feed_a_growing_world.html
- 2018 – Scientists work toward new canola varieties as clubroot spreads across the Prairies https://www.lightsource.ca/news/details/scientists_work_toward_new_canola_varieties_as_clubroot_spreads_across_the_prairies.html
- 2017 – New screening technique will allow crop breeders to develop drought resistant varieties faster https://www.lightsource.ca/news/details/new_screening_technique_will_allow_crop_breeders_to_develop_drought_resistant_varieties_faster
- 2017 – Research on soil acidity could lead to new wheat varieties https://www.lightsource.ca/news/details/research_on_soil_acidity_could_lead_to_new_wheat_varieties.html
- 2016 – Quick cooking chickpeas use microwave - but not how you'd expect http://www.lightsource.ca/news/details/quick_cooking_chickpeas_use_microwave_but_not_how_you_d_expect2.html

- 2015 – The synchrotron and crop improvement <https://issuu.com/skagriview/docs>

CROPS

The synchrotron and crop improvement



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The Canadian Light Source (CLS) synchrotron in Saskatoon is one of the technological masterpieces of Saskatchewan's growing research community. The synchrotron is a source of brilliant light—millions of times brighter than even the sun—which enables scientists to study the microstructural and chemical properties of materials. Scientists have used the synchrotron light to collect detailed chemical and structural information at the molecular and atomic levels, with applications ranging from mine tailing remediation to cancer research and cutting-edge materials development.

Now, the synchrotron is being used to investigate structural and biochemical changes associated with crop growth and development, thanks to the efforts of CLS staff and researchers from the National Research Council-Saskatoon, the University of Saskatchewan and Agriculture and Agri-Food Canada, as well as funding from the Saskatchewan Agriculture Development Fund.



The synchrotron reveals the structural and biomolecular differences in fusarium-resistant, -tolerant and -susceptible wheat spikelets.

The researchers studied a variety of wheat and chickpea cultivars to see if they could determine what made them susceptible or resistant to fusarium head blight (FHB), water stress and, for chickpeas, ascochyta blight.

In the FHB study, the researchers detected significant differences in the spikes of resistant, tolerant and susceptible wheat cultivars, raising the possibility of developing a biochemical marker to identify/screen improved FHB-resistant wheat varieties. In the chickpeas, the researchers found that ascochyta-resistant cultivars had higher levels of iron in their leaves.

Next, the researchers studied the response of plants to environmental factors such as heat and drought. Again, the synchrotron found significant differences between drought-tolerant and drought-susceptible wheat and pea cultivars.

The results of this project show that the synchrotron can be used in combination with the latest genomics and plant breeding approaches to develop improved crops for Western Canada in the near future. ■



Visit the Saskatchewan Agriculture research reports page at www.agriculture.gov.sk.ca/ADP/Search and enter the report number #20130054 into the search function.

[/agriview_september_2015](#)

- 2015 – It's good to have a thick skin - Researchers say thick cell walls could be key to Fusarium resistance <http://www.producer.com/2015/05/its-good-to-have-a-thick-skin/>
- 2014 – Light can be used to study plants and scientists using the synchrotron can study the molecular structure of plants that can be used for different research purposes. <http://globalnews.ca/video/1552670/innovation-you-can-see>
- 2014 - CLS news release and CTV media release on farm-gate show on “Research will help to develop new ‘ancient’ grain varieties for Canadian growth” http://www.lightsource.ca/news/media_release_20140210.php