

New strain of barley could grow in drought conditions

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Beer buffs and barley breeders may rejoice now that University of Alberta scientists have pinpointed a gene that could allow barley to grow using less water.

Driven by the drought that hit Canada's prairie regions in 2002 and cut Alberta's average crop yield in half, researcher Anthony Anyia of *Alberta Innovates — Technology Futures* and soil scientist Scott Chang were determined to find segments in the genetic makeup of barley called molecular markers, which control its water efficiency.

"Our goal was to produce more grains per drop of water — that is, to maximize crop productivity, given (a) limited water supply," Chang explained.

"This particular work is really to try to develop a tool that will help barley breeders select the genotypes that use water more efficiently."

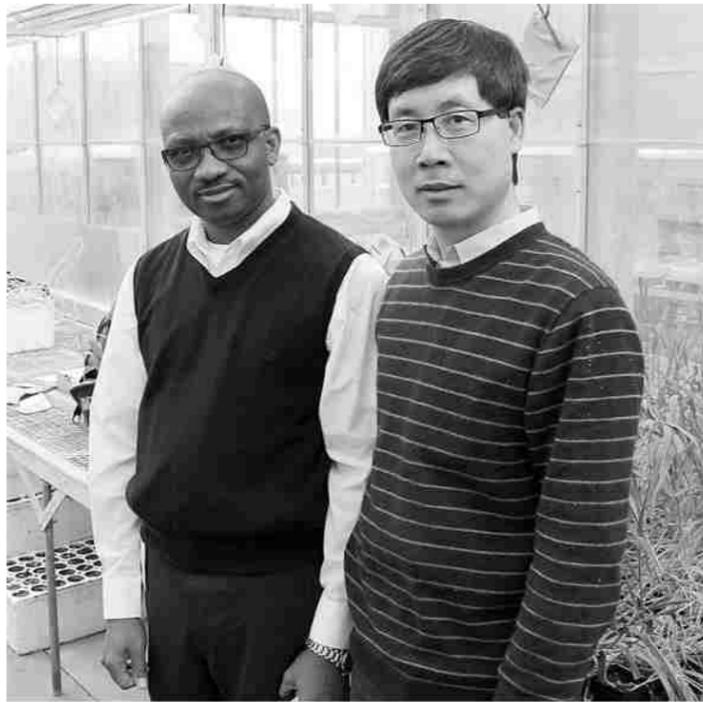
While similar research was also conducted on other major crops including wheat, oats and flax fibres, Anyia and Chang decided in 2005 to focus on barley, given its importance in Alberta agriculture. Used for malt beer and livestock fodder, this Canadian staple is the third most widely-grown crop in the Prairies, after wheat and canola.

Anyia likened the research to an iPhone application. Much like choosing an app on a smartphone, specific traits are also targeted in the breeding process to generate new varieties of barley.

"Maybe this is the GPS, so that it can help navigate more water that is available for it to grow," Anyia said.

"You can put in the water efficiency trait, disease resistance ... those are all 'applications' that you need to combine so that the plant is able to function in the environment in which you want it to function."

To pinpoint the precise location of the desired genes, Chang, Anyia and their former PhD student, Jing Chen, tested a long-standing theory which suggested plants' discrimination against heavier carbon isotopes is correlated to their



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water-use efficiency.

"In drought conditions, the stomata on the leaves tend to close," explained Chang, referring to the microscopic pores on plant leaves responsible for the exchange of gases. These pores seal up in dry environments, preventing excess water loss — a natural reaction to thwart the exchange of carbon dioxide necessary for photosynthesis.

During photosynthesis, plants usually "discriminate" in favour of CO₂ containing the lighter isotope, Carbon-12. However, when moisture is scarce, plants rely more heavily on Carbon-13. During their research, the team discovered that for barley, these differences in isotopic discrimination are highly correlated with how well the plant salvages water.

"Every time, there was a really good relationship between stable isotope discrimination and water-use efficiency," Chang said.

Conventionally, selecting genotypes with water-efficient characteristics is a long, costly process involving growing plants over a few generations, quantifying grain production

and budgeting water and biomass with specialized tools. That process currently takes between 10 and 15 years.

However, in this study, Anyia and Chang identified molecular markers which, once refined and validated, can be used in breeding programs to fast-track the barley genotypes less dependent on water, and therefore better fit the Prairies' climate.

"You definitely want a plant that is smart — that knows when to open and when to close its stomata," Anyia explained.

"It is possible with this tool to design a strain that performs really well when moisture is sufficient, and the traits of water-use efficiency only kick in when conditions become poor."

Molecular marker refinement could take two or three years, once funding is in place, and the researchers are hoping public interest will help secure funds for the next stage of development.

"We want to be able to show that this is something that is going to be stable, repeated and that can be reliably used," Anyia said.

Confidential meeting addresses charges against LHSA, sparks legal fees increase

LISTER • CONTINUED FROM PAGE 1

She added decisions are made on a case-by-case basis to protect the integrity of the university's processes, but that it's extremely unlikely a student would be forbidden from even revealing the fact they've been charged.

"I don't know that anyone would ever be prohibited," she said. "Again, I don't know the circumstances, so it would be really hard to comment on that, but typically, no."

Once evidence is compiled and a case is built, Eerkes said the accused party is brought in for a meeting.

"That group, or student or whoever it is, has the opportunity to respond to the evidence, to provide other documentation, if there's something about that evidence that stands out as either incorrect or incomplete, that student group can say so. And then the Discipline Officer does further investigation," she explained.

"All of our decisions are appealable, and everything else, the

process is pretty much the same. Everyone has a right to hear the case against them, to provide some sort of information or defense, bring an advisor, all of those things," Eerkes said.

"In terms of everything that's going on, we are not in the know, because (Martin) has not been able to tell us anything."

SAADIQ SUMAR
STUDENTS' UNION VICE-PRESIDENT (STUDENT LIFE)

When asked for comment, SU Vice-President (Student Life) Saadiq Sumar said Martin was the best person to comment on the matter.

"In terms of everything that's going on, we are not in the know, because (Martin) has not been able to tell us anything," he said.

"Everything that we know, Council knows."

When asked during the *in camera* session why the SU isn't going through the ombudservice, Sumar told councillors he believes they have exhausted all other avenues of action.

"The reason why I believe the ombudservice would not do anyone justice, really, is that we believe the system itself, the Code itself is not written in a manner that is good for students," he said.

A statement from the U of A said it would be inappropriate for the university to comment on the proceeds of an *in camera* meeting, and that the university does not disclose particulars of discipline cases.

"Respecting the due process rights of students and student groups, as well as ensuring the integrity of the discipline process, is of the utmost importance," the statement read.

Council voted to pass the \$10,000 increase, with nine abstentions and zero against.

events listings

Take Back The Term!

Saturday, Feb. 2, 8:30 a.m. to 2 p.m.
ETLC

Raj Patel: Food Cultures for Sustainability

Wednesday, Jan. 30, 7:30 p.m. – 9 p.m.
CCIS 1-430

Robert Fisk Arab Awakening: Are We Hearing the Truth?

Thursday, Jan. 31, 5:15 p.m. – 7:15 p.m.
Tory Lecture Theatres 11

Sheryl WuDunn Half the Sky: Turning Oppression into Opportunity for Women Worldwide

Thursday, Jan. 31, 7:30 p.m. – 9 p.m.
CCIS 1-430

Last Day For Payment of Winter Term Fees

Thursday, Jan. 31

Winter Term Refund Deadline

Feb. 6

news briefs

COMPILED BY April Hudson

UofA Escalator.com informs students

Students frustrated by the seemingly endless out-of-service escalators at the University of Alberta now have a new website they can reference when wondering which ones are running and which are down for maintenance.

The newly created UofA Escalator.com page, linked directly to an @UofA Escalator Twitter account, offers nearly up-to-the minute updates on the status of the U of A's escalators.

Professor named city's new top doctor

A new medical director was appointed last week for the Edmonton zone, after interim top doctor Tom Noseworthy returned to his job as associate chief medical doctor.

David Mador, a professor at the University of Alberta, will begin his term as the city region's top doctor on April 1, 2013.

This decision comes as the result of a "thorough and robust" national search for a replacement, according to an information memo distributed by Alberta Health Services to all AHS Practitioners.

"Dr. Mador has been practicing full-time as a urologic surgeon

in Edmonton, while maintaining his status as an Associate Clinical Professor in the Department of Surgery at the University of Alberta and has been the recipient of several medical student and resident teaching awards," the memo explained.

Mador has nearly 30 years of clinical experience, and has held numerous leadership positions in the past within the former Capital Health Authority, including Chief of Surgery and later Medical Director of the Royal Alexandra Hospital.

U of A business school in global top 100

The Alberta School of Business received worldwide recognition this week when it appeared in the 2013 Financial Times of London's list of the top 100 business schools in the world.

Including privately and publicly funded institutions, the school ranked 33rd globally for research, 71st for its PhD program, and sits in 100th place for its MBA.

Placed alongside other Canadian schools including the U of T, McGill and York, the Alberta School of Business also shares this list with prestigious institutions such as the London Business School and the Harvard Business School.