5 January 2018

SENT TO LSU AGCENTER/LOUISIANA FOREST PRODUCTS DEVELOPMENT CENTER - FOREST SECTOR / FORESTY PRODUCTS INTEREST GROUP

FINANCIAL POST

Car parts, yogurt, paint: Scientists are using wood in novel ways, hopefully staying the axe on forestry education before it's too late

PETER KUITENBROUWER
April 25, 2017
7:00 AM EDT

Ford has poured millions into forestry research at the University of Toronto to make car parts out of wood. But the school could 'restructure' the faculty, which may mean dismemberment

More and more people read articles such as this one on a screen, curbing the demand for newsprint. Our broom handles are made of plastic; our houses are brick, concrete and drywall. We just don't need trees the way we used to, which has researchers and the industry scrambling to find new applications.

One particularly novel idea is to build cars out of wood. On the surface, it sounds ridiculous. After all, wood is highly combustible and car engines quickly run hot. Still, that hasn't stopped the University of Toronto from trying to make it happen.

Inside the university's "high-performance bio-carbon composites pilot facility," is a machine that looks like something from a Dr. Seuss book, but it can make car parts from wood. Mohini Sain, U of T's dean of forestry, insists the parts are perfectly safe even though the aroma inside the facility smells a lot like a wood stove crackling to life in a ski chalet on a winter morning.

A few weeks ago, Ford Motor Company of Canada Ltd. summoned Sain to Windsor, Ont. There, in the presence of Prime Minister Justin Trudeau, Ford announced a $500-million research and development program in Canada that includes "lightweighting" — that is, car parts made with wood.

But this recognition of forestry's importance may have come too late for some.

A report last year by researchers from McGill University, University of California, Berkeley, and Sweden's University of Agricultural Sciences detailed the slow suffocation of U of T's forestry faculty, a fate that the researchers call misguided, given that forests alone hold the key to reversing global warming, since trees drink carbon dioxide and thus cool our planet.

"The attention paid to sustainable forest management has never been higher, and in the emerging bio-economy the demand for forest products and services is expected to grow," the researchers wrote. "In a country that owns 10 per cent of the world's forest, and 27 per cent of the world's boreal forest, the importance of this resource can hardly be overestimated."

Despite declines in demand for paper and other wood products, the forest sector remains important, contributing $20 billion to Canada's GDP in 2013 and the country is the world's biggest exporter of forest products.

Even so, *the U of T sees less use for study of forestry*. Last month Cheryl Regehr, U of T's provost (in charge of academic programs), alerted forestry faculty to a "potential academic restructuring" — in other words, the possible abolition of the program.

Leaders in Canada's forest industry are concerned. They fear that the move may signal that Canada, a forest industry superpower, is retreating from its history of innovation in the sector and ceding leadership to Europe and Asia.

The U of T is unmoved: President Meric Gertler recently turned down a meeting with the forestry faculty's advisory committee, angering a prominent industry figure.

"Your response to our request to meet with the advisory committee is to say the least, disappointing!" wrote Frank Dottori, a member of the Order of Canada and famed as the once-long-time chief executive of forest giant Tembec Inc., in an email to Gertler in mid-April.

Dottori, who now runs White River Forest Products Ltd. in northern Ontario, went on to say: "Obviously I am biased, but I am saddened by the lack of vision and commitment by the U of T to promoting this faculty."

Althea Blackburn-Evans, a spokesperson for the university, said, "The president looks to the provost to handle academic matters like this."

The study of forests in Canada has a rich history. Bernhard Eduard Fernow, North America's first professional forester, founded the country's first forestry faculty in Toronto in 1907, the same year Harvard University established Harvard Forest, its "3,500 acre lab and classroom." In 1989, Adam Zimmerman, who ran Noranda Inc., then Canada's largest forest products company, raised $32 million (and pried another $32 million from Ontario) for a new faculty headquarters, a soaring brick edifice in the heart of the University of Toronto.

In the faculty's hallways hang framed specimens of dozens of Ontario tree leaves, including 10 varieties of maple tree, and plaques for forestry faculty killed in the two World Wars. A staircase spirals around a suspended sculpture composed of hundreds of lengths of cherry wood — saved from the walls of the old forestry building — that together, hanging by wire from the ceiling, form a floating representation of a pine tree.

These days, the whole faculty seems to hang by a thread.

"We're a forest country," said Eric Davies, a PhD candidate in forestry. "The leaf is on our flag. We were pretty popular when we were helping (industry) cut forests. We invented forest inventory. But today, forestry has gone all mechanized. They have satellites. They don't need us anymore."

Davies believes the university wants to close forestry to free up prime real estate on campus.

"Everyone wants our space," he said. "It's right by the Faculty Club. It's like Boardwalk and Park Place."

Sain insists that inventions in the forestry faculty have the potential to transform several industries. He is a compact man with a wide grin, whose enthusiasm as a tour guide through the university's bio-carbon pilot facility brings to mind Willy Wonka in his chocolate factory. "Automotive is a big pillar for us," he said.

On the floor of the facility sits a 100-kilogram bail of New Brunswick pulp about the size of a coffee table. Shiang Law, a technician, peels a layer off the pulp and feeds it into a hopper. The "pelletizer" turns the pulp into what resemble Rice Krispies. He then pours the pulp pellets into an extruder, mixing in polypropylene (plastic) pellets, dyes, carbon fibre and other more secret ingredients.

"We put some spices in there," Sain said with a smile.

A hot black mixture that looks like tar oozes from the twin-screw extruder. The substance goes through a second mixer and then steel rollers flatten the compound into a sheet.

Sain shows off finished car parts moulded from the compound, including a cam cover, battery cover, oil pan and engine cover. These parts, he said, are lighter and stronger that those in use today, are heat resistant and made from a renewable resource.

He has other tricks up his sleeve, too. He displays a chunk of what looks like a giant Styrofoam banana. Called rigid lignin, this foam can fill a car bumper, making it "96-per-cent organic, mostly woody materials."

He hits an elevator button. "Let me take you to your next frontier of technology," Sain said, as the door opens on an upper floor: "Nano-technology." He unlocks a fridge and pulls out a white plastic bucket filled with a creamy white substance, like hair gel.

"This is nano-cellulose," he said. "You can put it in cosmetics, in yogurt. You can make one-coat nano-paints."

In another lab, he shows off what look like sheets of plastic, but are actually made of wood. "This is lighter, flexible, portable and renewable," he said. "And it is from Mother Nature."

Separately, Sain is working on a 14-storey residence building at the university that is made of wood.

Sandy Smith, a former dean of forestry at the school, applauds Sain's work. Smith, who studies forest insects, said society must view foresters not as tree huggers, but as innovators keen on harnessing wood's useful potential.

"Mohini is a businessman, and forestry is about business," she said. "If people don't get livelihoods from the forest, then we lose the forest."

The forestry faculty's Latin motto, "In reliquum tempus arbores hodie," translates as, "Trees today for the rest of time." But Smith fears that the "Harvard MBAs running the university these days" will scrap her old faculty for short-term gain, and miss out on its long-term potential.

Sain's five-year term as dean ends in June. On the plus side, after forestry professors made a lot of noise, the U of T recently agreed to appoint a new dean of forestry.

Regehr, the provost, insists that the school values its foresters.

"We do want these programs to flourish," she said. "Student demand for forestry has declined. The university has to look at the demand we have from students and ensure we have faculty in areas where we have student demand. We are absolutely committed to forest sciences."

But numbers provided by the Faculty of Forestry suggest that both undergraduate and graduate enrolment are on the rise.

Canada's eight forestry faculties — from the University of New Brunswick in the east to the University of British Columbia in the west — have all had to adapt as forestry mechanizes, the industry consolidates and demand for forest products ebbs and flows.

"All the schools have developed strategies to raise their profiles," Smith said. "Some are showing more environmental links. UBC has courted Asian students."

Peter Schleifenbaum, who owns one of the biggest private forests in Ontario, the 40,000-hectare Haliburton Forest about 300 kilometres northeast of Toronto, fears for the future of the industry. Every year, U of T forestry masters students begin their program with a week in his forest. Schleifenbaum sits on the faculty advisory committee.

"Faculty of Forestry graduates occupy positions all across the emerging carbon economy, from forests to carbon traders, policymakers, industry and NGOs," he said in an email. "We need forestry and especially forestry education and research now more than ever. This is not the time for U of T administration to play games."

A few days after the Ford announcement in Windsor, Sain flew to India for the Commonwealth Forestry Forum. He came back and left again, this time to Shenzhen, China, accompanied by Reza Moridi, Ontario's minister of research, innovation and science.

Sain fears that China will adapt his wood-based technology even as Ontario closes its forestry schools. "China has the drive to adapt technology more quickly," he said.

Financial Post
pkuitenbrouwer@nationalpost.com

Richard P. Vlosky, Ph.D.
Director, Louisiana Forest Products Development Center
Crosby Land & Resources Endowed Professor of Forest Sector Business Development
Room 227, School of Renewable Natural Resources
Louisiana State University, Baton Rouge, LA 70803
Phone (office): (225) 578-4527; Fax: (225) 578-4251; Mobile Phone: (225) 223-1931
Web Site: www.LFPDC.lsu.edu

President, Forest Products Society; President, WoodEMA i.a.