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The prestigious LEED certification process lacks an official connection to indoor plants. Project Carbon is looking to change all that.

by PETE MIHALEK
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FOR greenhouse growers, the U.S. Green Building Council is a tough nut to crack, especially when it comes to its Leadership in Energy and Environmental Design (LEED) certification process.

LEED is a prestigious third-party certification program and a national benchmark that promotes a whole-building approach to sustainability in five key areas of human and environmental health, says Dr. Bodie Pennisi, Horticulture Department, University of Georgia. These five areas include: LEED development, water savings, energy efficiency, materials selection and indoor environmental quality.

This certification lacks any official agricultural connection to indoor plants and the role they play in improving human health by improving indoor air quality, Pennisi says.

Green Plants For Green Buildings (GPGB) President Mike Lewis adds, "Ironically enough, you can have the greenest building on the planet and do not have a single

A LEEDing Role

According to the United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) is an internationally recognized green building certification system providing third-party verification that a building or community was designed and built using strategies aimed at improving performance across all the metrics that matter most: energy savings, water efficiency, carbon dioxide emissions reduction, improved indoor environmental

quality and stewardship of resources and sensitivity to their impacts.

LEED provides building owners and operators a concise framework for identifying and implementing

practical and measurable green building design, construction, operations and maintenance solutions.

Bill Lyden of Farm Life Tropical Foliage says, "The direction for any new construction is towards green, eco-friendly buildings. If we ever do get LEED points awarded for getting plants inside of these buildings, then I think there will be a huge demand for interior plant material. This would be quite an opportunity for growers to capitalize on and put in their marketing programs."

The three key issues responsible for keeping indoor plants down and out of LEED's current rating system are maintenance, transportation and a presumed expendability. Lyden says,

"Moving plants from South Florida where they're grown to Minneapolis where a new building is can use too much fossil fuel. Also, in a recession like the one we're in right now, it's hard to justify keeping a plant program if people are getting laid off. Whereas, if plants are part of what makes a building green and part of the LEED criteria, the plants will stay."

living plant in it. Isn't that weird?

"If you look at the ads and catalogs of all the vendors that supply LEED certified buildings with their cabinets, carpet, paint, the HVAC, those pages are filled with pictures of palm trees and blooming plants, because people identify plants with being green."

Project Carbon is hoping to bridge that

disconnect through the work of Drs. Bodie Pennisi and Marc van Iersel from the University of Georgia, which is funded by the National Foliage Foundation (NFF).

Cold Hard Facts

Project Carbon, short for Quantification of Carbon Assimilation in Interiorscape Plants, aims to address this question: If an

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interiorscape of a certain size and plant species is implemented under typical light levels, how much carbon would be removed from the air over a given period?

Pennisi and van Iersel worked with 216 4-inch plants under three light levels. The plants used were *Ficus benjamina*, pothos, philodendron, sansevieria, aglaonema and spathiphyllum. After a ten-week period,

these plants “fixed” a total of 700 grams of carbon under simulated conditions, Pennisi reports.

Also in their findings she adds, “Plants absorb carbon dioxide as a molecule. One might argue that what should be reported as a positive impact on the environment is the carbon dioxide removal and not just carbon removal.”



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*Information provided by Green Plants For Green Buildings

The results of Project Carbon are currently in the preliminary stage. Pennisi will be presenting her and van Iersel’s findings at the Tropical Plant Industry Exhibition (TPIE) this month, January 14-16.

Along with carbon dioxide removal, prior research has found indoor plants excel at removing a significant amount of volatile organic compounds (VOCs). In what Pennisi calls “phytoremediation,” plants in closed quarters can aid in depleting the air of octane, benzene, trichloroethylene and formaldehyde, to name a few. These VOCs emanate from such things as carpeting, occupants, newspapers, CD players and adhesives.

“We’re seeing some shift away from using plants in newly designed buildings because of cleaner, more stylized designs,” GPGB President Mike Lewis says. “We feel it’s important that at a table when a building is being designed or renovated that plants be represented. Lacking any real data regarding the carbon removal capabilities of live plants, it was difficult to make that case.”



More Online

For Linda Reindl’s FNGLA Director of Education thoughts on Project Carbon visit GreenhouseGrower.com

Lewis goes on to say that a new, fresh scientific argument is needed in earnest to make a real impression on today’s architects, interior designers and building



Did You Know...

•In a study conducted by Virginia Lohr of Washington State University- subject reaction times to a computer program were ¹² times faster when plants were present Blood pressure taken during the same study showed visual exposure to plant settings could produce significant recovery from stress within five minutes-

•The air inside sealed energy efficient buildings is often ¹⁰ times more polluted than the air outside due to toxic emissions from a variety of building constituents-

•Plants reduce fatigue headache coughing and irritation of the eyes by ³⁰ percent-

*Information provided by Green Plants For Green Buildings

owners. "We're not out of the game by any means and that's why we're pushing hard with Project Carbon," Lewis says.

Before the Funding

Well before the NFF funding, the groundwork for research efforts like Project Carbon was laid by the U.S. Military and NASA research scientist Bill Wolverton back in the 1960s, Pennisi says.

Wolverton began to experiment with water hyacinths and other swamp plants. He tested their ability to clean up contaminants from water, specifically Agent Orange. He then moved his work to the BioHome at NASA's Stennis Space Center to study indoor house plants as air purifiers.

Pennisi says Wolverton hypothesized that plants emit water vapor that creates a pumping action to pull contaminated air down around a plant's roots. There, it's converted into food for the plant.

She adds that other researchers have shown VOC removal through a plant's

stomatal uptake, absorption and adsorption to plant surfaces.

"Plants do a lot more than people realize," Lewis says. "Scientists know it, people know it, but no one has done any quantifiable measurement on exactly what they do. We need good, strong talking points – Project Carbon being one of them." GG

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