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# Gardens That Grow on Walls

By KRISTINA SHEVORY

GIVEN the chance to accompany a team of botanists on a plant-collecting expedition to South America, most gardeners would probably be satisfied with the experience. They wouldn't come home and try to recreate the [rain forest](#) in Manhattan.

But Michael Riley isn't like most gardeners. Mr. Riley, a former commodities trader turned plant expert who went on to become assistant director of the Horticultural Society of New York, was eager to move beyond potted plants in a way that hadn't yet occurred to many others. It took a number of expeditions, a lot of research and more than a decade and a half, but by 2003 he had figured out how to grow a wall of plants inside his Upper West Side apartment.

"In the rain forest, I realized that plants didn't need to grow in pots with labels," said Mr. Riley, 64. "I wanted to grow plants in ways that were natural to them."

With his partner, Francisco Correa, a Spanish teacher who is now 52, Mr. Riley attacked a corner of his living area, stripping the walls of plaster and affixing exterior-grade plywood to new and existing building studs. On top of the plywood went bitumen roofing to protect the walls. Cork bark was then stapled over that, and plants were inserted into pockets in the cork. Sprinklers and lighting were installed overhead, trenches were put in at the base of the walls to catch water that trickled down, and pools were added in the middle of the room to increase humidity.

These days, Mr. Riley's project isn't that unusual. Vertical gardens — which began as an experiment in 1988 by Patrick Blanc, a French botanist intent on creating a garden without dirt — are becoming increasingly popular at home. Avid and aspiring gardeners, frustrated with little outdoor space, are taking another look at their walls and noticing something new: more space. And a number of companies are selling ready-made systems and all-in-one kits for gardeners like Mr. Riley who want to do it themselves. (For those who prefer to leave it to the professionals, landscape designers can build vertical gardens for a hefty fee.)

In the last few years, companies that sell green wall supplies have seen a jump in sales. ELT, an Ontario company that specializes in green roofs, began selling living wall systems a little over three years ago and is now one of the biggest suppliers to the United States. Greg Garner, the company's president, said that its green-wall sales have increased 300 percent since 2008. Four months ago, the company introduced a cheaper, lighter kit to make living walls accessible to the average gardener; prices start at about \$40 for a one-square-foot panel.

“We’ve turned living walls into something anyone can do,” Mr. Garner said. “The walls have gone from zero percent of our business leads to 80 percent of our business, and it’s happening all over the place, from the Middle East to North America to Europe.”

Another big living-wall company, Gsky Plant Systems in Vancouver, British Columbia, was founded four years ago as a green roof supplier but now focuses almost exclusively on vertical gardens, which it designs, installs and maintains for around \$125 a square foot. Hal Thorne, Gsky’s chairman, said the company’s growth in the last year “was phenomenal — we nearly doubled sales.”

Many of the modular systems — essentially plastic trays filled with dirt and attached to a wall, with a sprinkler or drip irrigation system installed above — differ dramatically from Patrick Blanc’s living walls, which can be seen in commercial and institutional buildings around the world, including the Athenaeum hotel in London and the Musée du Quai Branly in Paris.

Mr. Blanc, who was inspired by tropical rain-forest plants he had studied, knew plants could survive on water and fertilizer alone, and developed a system for growing them on walls lined with felt. The living wall was part of his effort to bring greenery into cities. “When you live in towns, you don’t always go into gardens,” he said. “It’s really important to use empty spaces to invite nature into town.”

He is not a fan of the new kits. On a recent visit to San Francisco to begin work on a green wall for a private high school, his largest outdoor vertical garden in North America, Mr. Blanc dismissed them as artificial. Plants may grow vertically on a surface like the face of a cliff, he said, but “in nature, you don’t have vertical dirt.”

At a local nursery, he pointed at one modular system: “This is very heavy and a lot of plastic,” he said. “After three to five years, you have no more substrate — the dirt gets compacted.”

Last year, inspired by Mr. Blanc’s work, Matthew McGregor-Mento, 38, an executive creative director at Gyro: HSR, a New York advertising agency, and his wife, Emma, 35, a massage therapist, set out to build a vertical garden in their two-bedroom apartment in the East Village. They attached an 8-by-10-foot aluminum frame to a wall in the entry hall, screwed waterproof sheets of PVC to the frame and tacked on two layers of matting. Then they inserted some 400 plants — philodendrons, ivies and ferns — into holes they cut in the felt.

A trough they installed along the floor collects runoff water from the irrigation system, and a pump with a filtration sponge sends it back up the wall. Timers control the watering, which happens four times a day.

The design, which they devised with the help of a horticulturalist friend, was based on Mr. Blanc’s system and on research they had done online. The total cost was \$3,000, but the result was worth it, Mr. McGregor-Mento said. Most people who visit want a green wall of their own, and the effort involved wasn’t that onerous: “Building a vertical wall is about as difficult as painting a room.”

Others have found it more challenging. Peter Kastan, an unemployed movie location scout in Miami, had never grown anything when he decided to install a vertical garden in a friend's loft. The apartment, which his friend offered to him as a laboratory since it was vacant and he couldn't rent it, had abundant light and high ceilings, and Mr. Kastan, after reading about Mr. Blanc's living gardens online, thought it would be an ideal environment.

He began by contacting living-wall creators around the world for advice, and then drove all over Florida visiting nurseries to find plants. He bought 650, including bromeliads, hoyas, begonias and ferns, favoring those that were local and "the most interesting to look at," he said. And one weekend last November, he and his wife, Mai Tran, and a friend put up the 12-by-12-foot plant wall.

Like Mr. McGregor-Mento, Mr. Kastan used matting affixed to a metal frame bolted to the wall. He bought most of the materials from local hardware stores or online suppliers. About \$10,000 later, he has a large, vibrant green wall. He recently completed a smaller one in the kitchen, with herbs and mini-tomatoes.

But it took a lot of work to get the irrigation, the lighting and the plants right. The first month, he lost several plants near the bottom of the wall, where water was collecting. He realized then that some plants were getting too much water and needed to be moved a different spot on the wall; others he had to get rid of.

"It's like having a large poodle," Mr. Kastan said. "You have to take care of it, feed it, walk it. It's intensive care for plants."

Even professional gardeners sometimes have trouble with their first living wall. Martha Desbiens, a co-owner of VertNY, a landscape design firm specializing in roof gardens, used sedums in a green wall on a client's terrace, and they dried out over the winter while the irrigation system was off. In a roof garden, they would have gotten plenty of moisture from snow, she noted, but planted vertically, they didn't get nearly enough.

"A lot of living walls fail," Ms. Desbiens said. "There's a big learning curve."

Marguerite Wells, a co-owner of Motherplants, a nursery in Ithaca, said she tries to steer people away from them.

"People want green bling," Ms. Wells said. "People think, 'It looks beautiful and perfect, and I want something beautiful and perfect in my life.'"

But vertical gardens can't be watered with a hose or ignored for long stretches of time, she noted, and won't tolerate certain plants. Inevitably, the irrigation stops working, she said, whether the pumps break down, the emitters get clogged (if a dirt system is used) or water gets stuck in one cell of a modular system. And within a few days of any malfunction, plants begin to die.

Amelia Lima, a landscape designer in San Diego, encountered the most basic problem when she

decided to turn the 40-foot wall in her backyard into a vertical garden. At first, she tried hanging plants and art on the wall, which faced the picture windows in her living room and kitchen, but it looked drab. Then she found a landscape architect who had worked with Patrick Blanc on a project in Brazil and hired him to help. But halfway through the project, she realized she had forgotten something essential: a water source.

“People think it’s a green wall,” Ms. Lima said, as in, “you hang a picture on the wall and it’s done.”

But there’s a lot more to it than that, she added: “There’s construction, watering — you’re making a garden.”

### **Just Another Plant in The Wall**

Making your own living wall can be done in one of two ways — as a fully bespoke model or something more off-the-rack. Whichever you choose, there are a few things to keep in mind.

- Vertical gardens are heavy, and not every wall is strong enough to support one. Check with a carpenter or your landlord to make sure the designated wall can handle the load.
- When selecting a spot for your living wall, make sure the area gets plenty of light. The best light is natural, but you will also need to install artificial lighting.
- Custom installations like the ones Patrick Blanc builds require a frame that can be attached to the wall, a waterproof barrier to protect the wall, a surface material like felt or cork to hold the plants in place and an irrigation system with PVC or polyethylene tubing and a submersible pump (the kind found in aquarium shops).
- Ready-made vertical garden kits have small containers angled to hold dirt and can be watered manually. After you plant your cuttings in the dirt, you’ll need to let them grow horizontally for several months so they develop strong roots. Once the roots have taken hold, you can attach the kit to the wall. (Kits are available from a number of sources, including [elivingwalls.com](http://elivingwalls.com), [sgplants.com](http://sgplants.com) and [floragrubb.com](http://floragrubb.com).)
- Each wall has different requirements, depending on its light and plants (talk to a local nursery or green-roof specialist about the best plants for your wall), but many people water their vertical gardens three times a day for 8 to 10 minutes. You will need to add fertilizer to the water to make sure the plants get necessary nutrients.