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Rooftop crops catch on.

BY LEIGH NEWMAN

IT'S NOT EVERY DAY that your new neighbor straps on her sunglasses, climbs out her window and proceeds to weed-whack her roof. But that's what the couple who moved in next door to Amy Norquist witnessed this summer. "With all the rain, the sedum and lavender had bloomed really heavily," Norquist says. "So I had to go out there and whack it back. I had the two of them over for drinks a week or so after. We were all laughing about it."

Norquist, '86, is the founder of Greensulate, a Brooklyn-based company that designs and installs green roofs—essentially, plant-covered roofs that come with some sizable eco-friendly benefits.

The concept, she admits, still requires some explaining to your average American homeowner. Unlike, say, a container garden, green roofs are self-contained systems. They require no pots and thus resemble a garden or yard. The plants grow up from the roof itself and can keep growing for as long as a century, often with little or no irrigation.

Europe has long been the center for green roofing. In Norway, where some of the oldest ones are located, the motivation for their use was both the natural insulation the plants provided and, well, goats. "The goats ate off the roof when the snow was too high. Today we'd call that habitat creation."

Modern green roofs offer more benefits. First, they protect the original roof from damage due to humans, the sun and cold. Next, they eat CO₂ and produce oxygen, cleaning the air. A recent study showed that if all Detroit's rooftops were green, the carbon sequestered would equal that produced by 10,000 SUVs in a year. But the biggest advantage remains natural insulation. "For a one-story building," Norquist says, "you can save up to 73 percent of your energy use in the summertime."

Because green roofs can last up to three or four times as long as conventional roofs—a waterproof membrane seals the underlying structure—several cost-benefit studies show that extra initial costs (from \$8 to \$30 per square foot and up) can be recouped in 20 years. "From that point, you're making money," says Tom Liptan, eco-roof program manager for Portland, Ore. In addition, the insurance



ROOM AT THE TOP: Norquist dreams of green-roof domination.

Ashton Worthington

industry is starting to grant discounts for green building elements.



ROOF RAISING: Norquist used sedum, native grasses and lavender atop a Manhattan penthouse (above); sedum, grasses and thyme for a Brooklyn condo (below).

Courtesy Greensulate

A number of North American municipalities encourage green roofs. A new bylaw in Toronto requires all new construction with more than 2,000 square meters of floor space to use 20 to 60 percent green roofing. Some jurisdictions, including Chicago and Portland, Ore., offer rate-paying and other incentive and grants.

Working in a converted factory, in an office filled with sleek Danish chairs and glowing white Macs, Norquist heads up a team that does everything from evaluating a project's structural needs to installing the roof to supplying lightweight soil mixtures and designing layouts. She speaks quickly, her green eyes (a touch of genetic foreshadowing?) glowing with concentration.

"I've been an amateur horticulturist since the age of 10," Norquist says about her childhood in Washington state. For 20 years, though, she worked as an executive at environmental nonprofits in the Bay Area and New York. It was her previous job at Beacon Institute, a leading river research and education agency, where she found

her calling. Beacon was retrofitting some abandoned factories with cutting-edge eco-technologies. During the process, as deputy director, she was introduced to her first green roof—and promptly became obsessed.

Four years later, she started her company. "This is my first stab at capitalism," Norquist says. "In a nonprofit, you work hard, but you don't necessarily get direct results. With Greensulate, the more green roofs we install, the more impact on the environment we have."

Norquist's major in history helped her research what she needed to retrain herself, and Stanford connections gave her emotional and professional support. Corinne Nevinny, '81, and Kate Gerwe, '83, MBA '90, contributed business acumen. Diana Zock, '86, offered her expertise as a landscape architect.

In 2007, Greensulate officially opened its doors, transforming roofs of Los Angeles homes with spare, Japanese-style architectural layouts, Brooklyn condos with romantic fields of thyme and Manhattan townhouses with cool, alpine sedum.

Malcolm Gladwell, author of *The Tipping Point* and *Outliers*, was an early client. "I just told her go for it," he says. "She created this wild variety of blooming sedum in all



Courtesy Greensulate

different yellows and purples, then left me a little stone paved area for my lounge chair. I sit up there with a drink in the evenings. It's like you're in the middle of this beautiful garden and you're in the middle of the city."

The plants Norquist installs end up creating havens for other creatures. "The moment we start bringing plants up," she says, "the honeybees show up. It's so uplifting." Quickly, she ticks off other statistics: In hospitals with accessible green roofs, recovery rates for patients are quicker and the need for pain medication is less. In workplaces, absenteeism is reduced and productivity increased.

Despite the stagnant economy, the green-roof business has been booming, growing 35 percent in 2008. "The fiscal benefits are great," she admits. "But I've always been a mission-driven person."

To that end, Norquist now travels the world, spreading the word. She has visited the Musée de Quai Branly in Paris to see its green walls: landscaping planted vertically to climb up the side of a building. She has run workshops for New York City park officials and labor unions—an interesting choice considering that by sharing her knowledge, she's giving up a fair share of her own intellectual capital.

"I want people to look out their windows and see a lot of green roofs," she says. Her most public cause has been advocating the use of green roofs to prevent flooding in city storm systems and, most recently, promoting the use of green roofs over so-called white roofs. "In cities, a roof that's painted white may save energy, but soot and dirt will turn it dark quickly, negating those savings."

Other projects in the works are greening the roof of a large homeless shelter in Florida and installing a green roof living lab for a New York City high school. But her dream project is much more practical: green-roof domination. "I'd like to do an entire neighborhood. You can affect the temperature of that whole area that way. You can change the storm systems."

For now, she takes it one roof at time. "I think Flo Mo would be a great green roof," she says, speaking of her freshman dorm. "At Stanford you have all these red-tile roofs. But Flo Mo? Now that's a flat surface with potential."

LEIGH NEWMAN, '93, *is a writer in Brooklyn.*

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