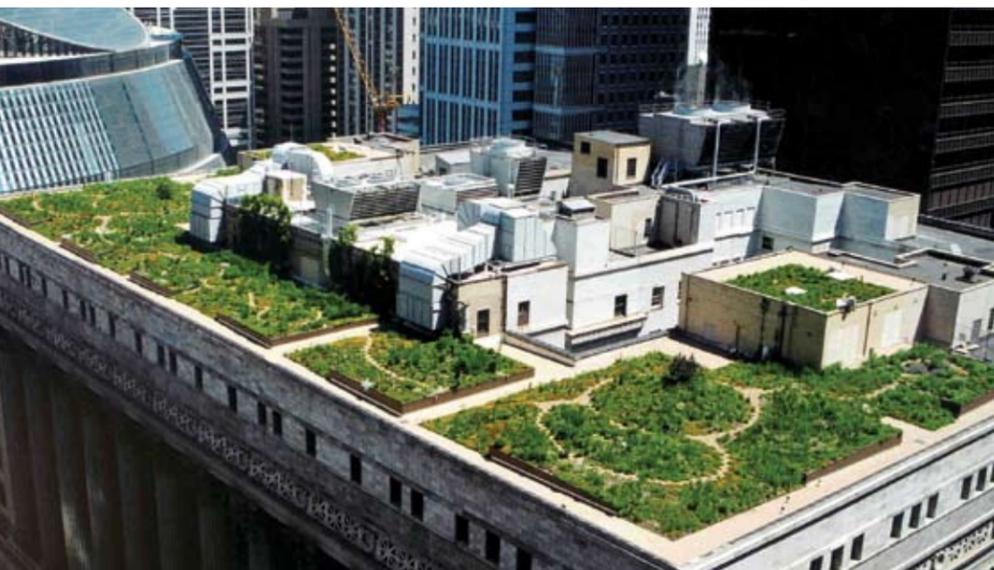


# How Does Your Garden Grow?

A new development in environmental design gives adornment to neglected space and a break to Mother Earth. » by NICOLE HOLLAND



**THE FEELING OF THE HARMONY FOUND IN NATURE IS INSPIRING.** On the East Coast, however, such peaceful tranquility is hard to come by. Skyscrapers and concrete replace hills and valleys, with the most popular garden being Madison Square. But for New Yorkers and other big-city dwellers, the seeds of creativity are growing in the most unlikely places, making tranquility just within reach.

Metropolitan areas such as New York and Chicago are adopting a concept called green roofs, otherwise known as rooftop gardens. Instead of neglecting the space on top of residential and commercial buildings, these cultivated creations are cropping up in its place. A fairly new concept to hit the United States, they are a great way to take advantage of unused real estate and create an ecological environment all can appreciate. As an urban retreat, green roofs are giving citified individuals an opportunity to design a private oasis.

"They give people extra space to enjoy," said Ed Snodgrass, president of Emory Knoll Farm, a nursery specializing in green roof foliage. The option is also perfect for regions like Chesapeake Bay, Md., where residents are unable by law to construct impervious areas on their property but would like to hire a builder for some type of renovation. "People can add on to where



Above: The garden atop Chicago's city hall. Left: A green roof renders many environmental benefits, including chemical-free fruit and vegetable gardens. Organic kitchens are a popular offspring from the fresh rooftop produce.

they normally cannot," Snodgrass said.

The gardens can range in content from the most simplistic to the highly ornamental. While some gardeners choose to harvest ordinary herb gardens, others create botanical masterpieces complete with water features and skylights. Deciding which is a better fit may hinge on one significant factor: "It is important to know how much weight the roof will hold," Snodgrass said.

When the designer is deciding on appropriate foliage, he or she should "choose plants that will live with roof conditions and not be a maintenance headache," Snodgrass said. The most popular choices are hardy succulents—plants have leaves and stems—which are fleshy and thick, such as al-

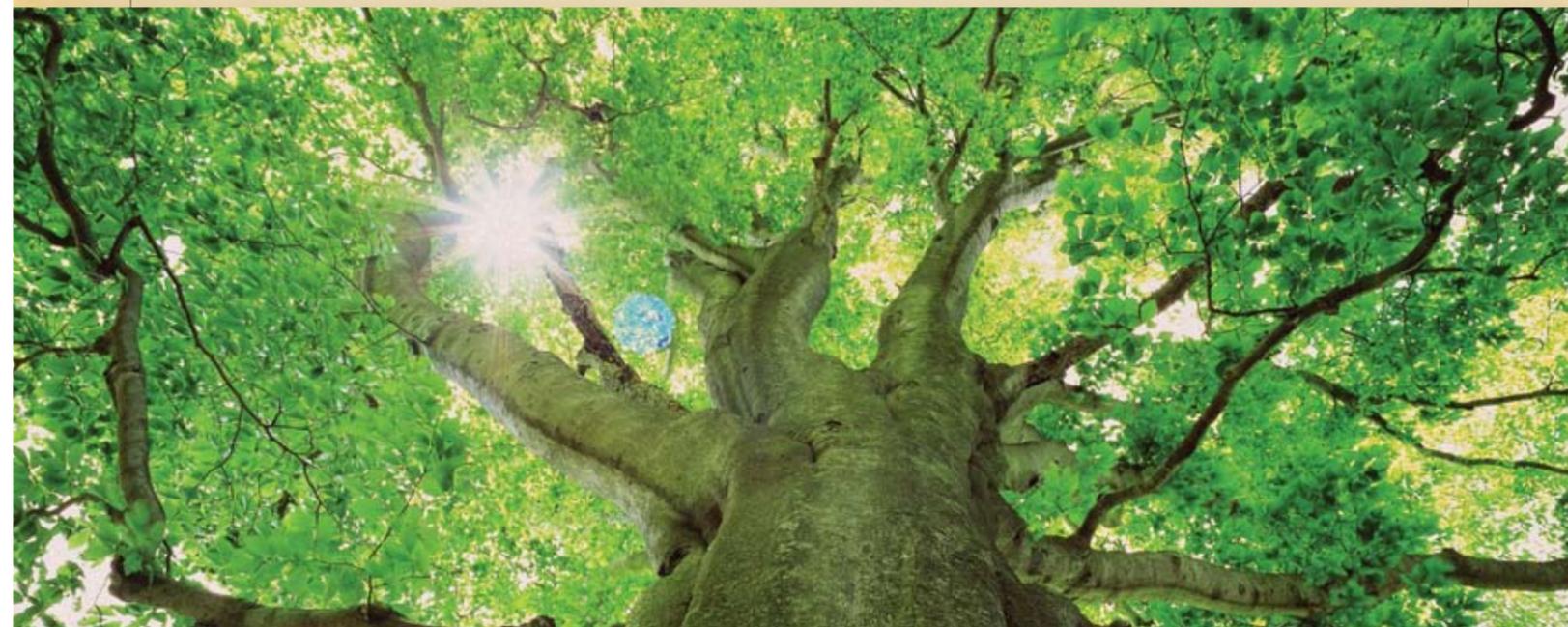
oes and cacti. They often have waxy outer layers that allow the plants to retain water well. It is wise to avoid plants with tap roots, which are long, vertically growing root systems. Also keep in mind that some plants have wind-blown seeds, which may be a nuisance if deposited where they are unwanted, such as the neighbor's roof.

Even though the cost is usually two to five times more expensive than a traditional roof, the economic and environmental benefits far outweigh the bottom dollar. "Because of the protection from UV degradation and temperature swings, which expand and contract the surface, the life of the roof is greatly extended," said Leslie Hoffman, architect and executive director of Earth Pledge, an organization dedicated to conservation. "It also increases biodiversity and the mitigation of the urban heat island."

Highly metropolitan areas commonly suffer from the phenomenon known as the urban heat island effect (UHI). This is when the city itself is significantly warmer than its surroundings. The EPA notes that "on hot summer days, urban air can be 2 to 10°F hotter than the surrounding countryside." This is because a city uses materials



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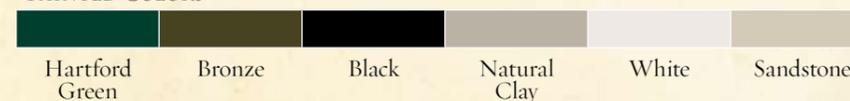


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## GREEN ROOFS 101

A short education on the costs, construction time and city codes associated with rooftop gardens.



**THE AVERAGE COST OF A GREEN ROOF DEPENDS ON ITS AMPLITUDE. BASED ON CONTENT, GREEN ROOFS**

**ARE TYPICALLY DIVIDED INTO TWO CATEGORIES.** An **intensive roof**, often called hi-profile, can replicate traditional lawn gardens because of its soil depths. It is built to accommodate large, deep-rooted plants, such as trees and shrubs. The garden often features waterfalls, sitting areas and other inanimate décor. Due to the maintenance requirement, the cost of intensive roofs can be high, as much as **\$25 to \$40 per square foot** and beyond.

An **extensive roof**, also known as low-profile, thrives on thin layers of soil and membrane. Common plants are mosses, herbs and other shallow-rooted specimens. Extensive roofs are less pricey, lighter and easier to manage. Another benefit is the cost, which can be as low as **\$5 per**

**square foot**, but they are more commonly **\$14 to \$25 per square foot**.

While researching specific design is helpful, following intuition will create a flourishing cultivation. "Every project is unique," said Linda S. Velazquez, publisher of [www.greenroofs.com](http://www.greenroofs.com), an Internet-based company serving as a green roof forum.

Construction time is dependent on many factors, just as in traditional roofing. A more simple method than planting by hand is to incorporate a modular system, which consists of pre-grown blankets of vegetation. These plots can be rolled out on the rooftop in only a matter of hours, combining the elements of drainage, soil and seed into one package.

Municipal codes are the only regulations with which rooftop gardens need to be concerned. There are no nationwide standards to meet, although the American Society for Testing and Materials is currently coming up with guidelines. At this point, it is up to the individual, and the sky's the limit.

such as concrete, asphalt and tar, which absorb larger amounts of heat than a natural environment.

There are several effects of UHI. Higher temperatures in urban heat islands increase the amount of energy needed to cool homes and buildings. The power plants, which supply the energy, burn more fossil fuels, increasing pollution levels and energy costs. Even smog, a chemical reaction of air pollutants, is intensified by higher temperatures. While green roofs alone will in no way solve the problem, they can help offset it by absorbing carbon dioxide and reflecting heat. Also, because black tar roofing is replaced by lighter soils, gravel and natural vegetation, the sun is reflected, lowering the temperature of a building.

Another good-to-all-mankind benefit is the reduction of storm water run-off. Because traditional roofs are impervious, precipitation is not absorbed. Depending on the volume of water that pools on the surface, flooding, erosion and water pollution may occur. A green roof will thrive off the natural rainwater, absorbing it rather than displacing it.

The integration of creativity and conservation in this beneficial feature will provide endless design opportunities. Civic buildings like Chicago's city hall have already adopted it. As build professionals and homeowners become more familiar with the project, it will be integrated more commonly not as an add-on, but as part of the initial blueprints of the building. Hoffman believes green roofs will improve the quality of life on a macro level. Other advocates praise its earth-saving abilities. Whether or not it will completely change people's lives ... that's for you to ponder. 



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