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THIN FARMING

Imagine farming in only 4 inches of soil. Windy City Harvest — the Chicago Botanic Garden's urban agriculture program — pioneered this method of "thin farming" in a highly visible setting: the roof of the West building of Chicago's McCormick Place convention facility. With its second growing season well underway, McCormick Place Rooftop Farm is proving that farming in depth-limited environments can be a reality.

Why grow in such a thin system? Chicago's progressive storm-water policies have cultivated a green veneer across the city's skyline, dominated by sedum green roofs with 3 to 4 inches of soil. These extensive green roofs similarly top a portion of McCormick Place's 27-acres of urban rooftop. In 2011, the convention center's in-house food service provider, SAVOR, approached the Chicago Botanic Garden to see if a public-private partnership could lead to a more, well, "fruitful" use of rooftop space at McCormick Place's West building. In June 2013, the project got off the ground as Windy City Harvest replaced 20,000 square feet (a half acre) of the roof's sedum with colorful rows of veggie starts. The roof now blossoms with drip-irrigated nightshades, leafy greens and even root crops.

"We have worked with [SAVOR's] chef to determine which crops are most interesting and less available through wholesalers," explains Angela Mason, the Chicago Botanic Garden's director of urban agriculture programs. "We really try to cater to the niche end of what he needs."

Rooftop Farm Coordinator Darius Jones lists this year's choice crops as, "Toscano, green Afro and red Russian kale; lunchbox, fish, lipstick and Carmen peppers; Japanese black, Moskvich and Wapsipinicon peach tomatoes; French breakfast radishes; black summer pac choi; [and] Hansel, Gretel and fairy tale eggplant." Shallow root crops such as atlas carrots and garlic are also on the menu, all for purchase by SAVOR for the building's 3 million annual eaters.

The first growing season, which experienced a late start and significant amendment experimentation, produced roughly 3,000 pounds of produce. Jones anticipates that lessons learned from the first season combined with the farm's field-tested amendment protocol will yield at least 18,000 pounds of roof-fresh produce during the 2014 season.

In general, the farmers have been pleasantly surprised by how well most crops have performed, despite thin farming's unique challenges. Limited root zone is, of course, the first hurdle. Adding soil depth would cause the farm to exceed the roof's load capacity (as determined by a structural engineer), so Windy City Harvest selects crops carefully and develops innovative methods for growing soil-intensive crops. One such method involves planting deep-rooted vegetables in mounded soil, contained within cylindrical, open-bottom felt sleeves.

COURTESY CHICAGO BOTANICAL GARDEN

Participants at Windy City Harvest in Chicago, Ill., acquire hands-on experience with sustainable vegetable production and learn essential business skills, including planning, pricing, sales and marketing.

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In the green-roof world, soil — or growth media — is designed to be light and structurally stable with high drainage potential and little risk of compaction. The key is very little organic matter, which tends to break down and compact over time.

McCormick Place Rooftop Farm was built atop existing green-roof media without the addition of more traditional agricultural soil, but how can this material possibly support vegetables? Windy City Harvest investigated this question through a multimonth experiment in which 2013 Rooftop Farm Coordinator Audra Lewicki applied varying amounts of vermicompost and manure-based compost via direct composting to a variety of vegetable starts throughout the farm.

Windy City Harvest Manager Kelly Larsen reports that "a 50-percent addition of [half] vermicompost and [half] manure-based compost mix," by volume, was determined to be the preferred amendment treatment for 2014. The farmers deploy additional sustainable agricultural practices such as intercropping, crop rotation, cover cropping, foliar feeding with seaweed, and integrated pest management to maintain plant and soil health.

At 5 stories high, the roof's exposure creates additional challenges typical of commercial, rooftop row farms. "Crops take a little longer to grow on the roof than on the ground," Jones explains. "There is much more wind, exposure and heat which all provide a completely different environment for the rooftop farm than our other [ground-level] farms."

Staking and protection of the roof's waterproofing membrane present further challenges requiring creative solutions. While McCormick Place already supports the Midwest's largest rooftop farm, the farm's 2014 performance will determine whether Windy City Harvest transforms an additional 20,000 square feet of green roof to reach a full acre of thin farm.

Windy City Harvest's commitment to education — though a Sustainable Agriculture Apprenticeship Program, Transitional Jobs Training Program for ex-offenders and future Rooftop Agriculture Certificate Program — suggest that thin farming will plant its seed in Chicago's robust urban agriculture scene. Germination of this bold idea could just lead to a skyline of delicious, re-envisioned green roofs. uf

Windy City Harvest is "a social enterprise that provides a certificate training program and internship in sustainable horticulture and urban agriculture."

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Check out Windy City Harvest online at **www.chicagobotanic.org/windycityharvest.**