



FROM GATES TO GRAPES

Researchers find parking lots can make excellent farms, even on top of pavement. And cities are sitting up and taking notice.



By Kim Fernandez

Joe Kovach looked out over a mostly-unused parking lot behind a closed dormitory at The Ohio State University in the fall of 2010 and pondered what potential might lie on the asphalt.

“I started wondering if we could make that productive,” says the associate professor of entomology (study of insects) at the university’s Ohio Agricultural Research and Development Center. His thoughts naturally turned to what might grow out there, and then to what might be different about pest management on pavement versus a traditional all-soil garden or farm. His inner scientist quickly weighed what might happen if he tried to grow food on the lot.

“When I saw it, I got really excited,” he says. “You have the dorm, then some lawn, and then the parking lot. So we’d be able to set up any treatment as a fair comparison—whatever we did on the parking lot, we could also do on the turf. Once I had access to soil, all I really needed was water, and we had water coming from the empty dorm.”

In other words, Kovach could not only try to grow food on this one parking lot, but also set it up in a way that might point to whether large-scale farming on unused asphalt might be a feasible way to increase crop yield across the midwest, where there are many older, unused lots just like Ohio State’s.

By the next summer, the eighth-acre lot had been transformed into a productive meadow, where blueberries, apples, peaches, raspberries, strawberries, and kale flourished in large pots and raised beds. The original asphalt sits largely untouched, complete with its yellow striping, ready to be used as a parking lot at any time it’s needed.

Kovach’s parking lot farm has, to date, gathered a lot of attention from both the mainstream press and researchers around the world. “We’ve had a lot of visitors,” he says. “There’s a lot of domestic and international interest among researchers and landscape architects. They’re all thinking about ways they can use this.”

The potential, he says, is huge.



Fruit trees at the parking lot farm at The Ohio State University

The city of Vancouver, Canada, is currently leasing the rooftop of one of its downtown parking garages to Alterrus Systems, which has developed a vertical gardening system called VertiCrop that's installed on hard surfaces to grow large quantities of leafy greens in relatively small spaces

Lots to Farms

Kovach says that just in the midwest, his parking lot farm research could change the way land is used, particularly when it's been abandoned. And that's not just true for parking lots.

"We have all these abandoned industry houses," he says. "They used to build factories and there were these houses for workers all around them. We can use that unproductive land."

He started his campus farm with trees and plants in large pots and raised beds, which didn't disturb the parking lot's asphalt. Some of the pots were hung on large panels, which maximized the square footage that was available. "Instead of having two rows of strawberries, we could have six rows," he says. "It became more efficient. And we had pots on the asphalt and pots on the lawn. We didn't destroy the asphalt—we put in raised beds that were 35 inches high. Half of them were on wood chips and half were on a potting soil mix."

After a little while, Kovach started wondering about the heat-containing ability of the asphalt and whether plants started in the ground (rather than in pots or raised beds) might enjoy a longer growing season because of it. Leaving the asphalt around the plants intact would be key to that experiment.

"I got an asphalt cutter and cut out the asphalt where planted rows would be," he says. "We cut rows 30 feet by three feet, scooped off the pavement, scooped off the soil underneath, and refilled them with our potting mix. Then we planted mature trees and dwarf trees."

Those trees were later covered in plastic, and the combination of the heat absorbed by the pavement and held by the plastic meant Kovach and his students could harvest fruit longer than from the trees he'd planted as a control in the lawn. "Most of the peaches where I had coverings over the asphalt really did hold that heat.



Lettuce grows in vertical racks atop a garage in Vancouver, Canada

We had a lot more fruit on the asphalt during high frost times than we had in the soil."

"You could grow lettuce year-round if you wanted to," he says. "We can do that in Ohio."

On the reverse side, he says, the higher heat in the summer didn't make much difference. "Surprisingly, even on the asphalt on those summer 100-degree days, it's hotter, but the trees and the bushes provide some shade. Plus we're watering regularly. There was some evaporation going on, but it's not as hot as you might have thought."

The in-ground treatment made harvesting fruit easier. "A nice tree stayed at eight feet high," he says. "Our other treatments put the trees three feet off the ground, so they were 11 feet tall. We needed a ladder. And so we tried to look at all of these different treatments and ask what we would do if we had a parking lot to farm. Because as long as you have water, you can grow stuff pretty well."

Smaller Scale

Kovach isn't the only one who's pondering the potential for growing food on parking lots and structures. The city of Vancouver, Canada, is currently leasing the rooftop of one of its downtown parking garages to Alterrus Systems, which has developed a vertical gardening system called VertiCrop that's installed on hard surfaces to grow large quantities of leafy greens in relatively small spaces.



Joe Kovach's parking lot farm features 6,000 plants and grows enough food to feed 30 people.

Vertical racks hold 12 layers of spinach, lettuces, and herbs in 3,000 trays across the deck's approximate 6,000 square feet. The racks shift positions so all the plants get the same light and heat, and are covered with a film to control temperature and humidity.

Parking garage roofs are good for farming in this manner, says Alterrus Strategic Advisor Donovan Woollard, because "they have decent weight capacity and freight access." And with greater emphasis on biking, walking, and using mass transit in the city, leasing the under-used parking deck made financial sense.

"This represents a new secure revenue stream that is consistent with the city's goals to be the world's greenest by 2020," Donovan says.

Donovan says the rooftop garden will grow about 130,000 pounds of greens every year. The crop is currently going to a large grocery store, a produce delivery service, and a few restaurants. An established Alterrus rooftop garden in England grows greens that feed the animals in a zoo.

Because the racks stay in constant motion, Donovan says the entire space can be used for plants—no aisles are needed in between—and the greens can be harvested within 20 days of planting. Additionally, the garage roof offers consistent sunlight and is shielded from winds by surrounding buildings, making it very farm-friendly.

Parking Farms

Back in Ohio, Kovach's farm currently hosts just more than 6,000 plants and, he says, grows enough food to feed about 30 people. So far, there is no measurable difference in yield between the plants on the pavement and those in the adjoining yard. Some of the food goes to the university for examination and research, and the rest goes to a community gardening group that sells it for funding. Additionally, he's partnered with the local court system so that people who are

assigned community service come to harvest the food and then sell it at a local market. "Most of the produce is used," he says. "We've been producing quite a lot of food on this parking lot." Watering is simple, and there's another benefit: "I don't have to weed," he says. "That's a big positive."

With all the visitors and press attention he's received, he says, he wouldn't be surprised to see his parking lot farm copied elsewhere. "I tell people to do the planting in the order of young fruit trees, then bushes, then vegetables just because the fruit is delayed gratification," he says. "If you're going to do this, it's three years before those are productive. But the quality of the fruit is really good. You can taste the sugars. The blueberries seem to be a little small, and we're thinking about that."

He currently starts farming around March 1 and harvests until mid-November. "We get so many green beans, I can't believe it," he says. "This is big for a research lot. Farming is all a matter of scale. When you start getting into intensive fruit and vegetable farming, an acre is pretty significant. That's a lot of food—an acre of food will feed 200-300 people a week."

The potential, he says, is big, but it's going to depend on how other people feel about farming on pavement.

"Part of my job is to educate people about what's possible," he says. "Where it goes from here depends on what people want. You can't compete with Walmart. You have to market this in a way that shows you're local, the food is picked ripe, and you don't have to ship it anywhere."

And, he says, those who'd like to start small-scale gardening on a parking lot might find it's not quite as instant as they initially thought.

"You need bird netting over berries," he says. "There are a lot of pests to take care of, even in urban settings. We have raccoons, skunks, and deer. I garden, therefore I fence, even in urban areas. You have to have a fence to keep two-legged predators out as well. That's the cost of doing business. It's not going to be cheap, but it can be profitable."



KIM FERNANDEZ is editor of *The Parking Professional*. She can be reached at fernandez@parking.org.