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Making Every Raindrop Count

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AUSTIN, Tex.

WITH 70 days of 100-plus temperatures so far and no rain in sight, Austin is in the grip of its worst one-year drought on record. And gardeners are quickly finding out which plants can survive brutal heat and drought.

Native trees like cedar elms and hackberries are dropping their leaves. Ash junipers in the Hill Country are dying. Shallow-rooted azaleas and crape myrtles are toast, and most lawns are brown, except for those watered by private wells.

Animals are suffering, too. Coyotes and rabbits are showing up in city gardens in search of water and food. Hummingbirds can't find nectar because many plants aren't flowering.

The first week of August, when daily temperatures climbed to 107 or so, a bison escaped from a ranch in Manchaca, on the southwest side of the city, and wandered into the Lady Bird Johnson Wildflower Center seven miles away, where it spent several days grazing in the savanna grasslands.

Gardeners are embracing those prairie grasses with equal enthusiasm because of their heat and drought tolerance. These natives can be found in many of the city's lawns, ornamental gardens and even green roofs. Remarkably, these deep-rooted plants can adjust to shallow soils, helping to cool houses and absorb rain — when there is some.

"If we get a rain, these grasses will all turn green," said Lars Stanley, 59, an architect and metal artist, standing on a roof planted with natives that covers the studio he built in East Austin with his wife, Lauren Woodward Stanley, 45, an architect. "It reduces our cooling level immensely."

The grasses (blue grama, curly mesquite, little bluestem and sideoats grama) go dormant in a drought, a survival strategy that keeps their roots alive. But the prickly pear and Texas sedum the Stanleys planted, succulents that store water in their fleshy pads, looked remarkably fine.

A plain black-tar roof can heat up to 170 to 200 degrees, Mr. Stanley noted.

The plants on this roof, rooted in five inches of a stony mix that includes crushed decomposed granite, perlite, lava rock, rice hulls and a dash of compost teeming with micro-organisms, "should

knock that temperature down 100 degrees,” he said.

“But they have to be green and evapo-transpiring to do that,” Ms. Stanley added. “We’re not going to water them in the midst of a drought.”

With its reservoirs half-empty and tributaries down to a trickle, the city is rationing water. And the Austin Water Utility is offering rebates of up to \$5,000 for installing residential rainwater collection systems.

When it does rain here, it tends to pour, sheeting across hard surfaces and dry lawns to storm sewers. So the more rain that is channeled into tanks or slowed by porous driveways and terraced gardens, the better for the land, as well as the water table, because plants will filter pollutants before sending water on to underground springs and tributaries to the Colorado River.

On the roof over the Stanleys’ studio, rainwater is channeled down a wide gutter that feeds into one of four 1,500-gallon tanks on the two-acre property. “We use the condensate from our air-conditioning also,” Mr. Stanley said. “It fills up a five-gallon bucket every two days, which adds to the tank.”

Other designers, like Christine Ten Eyck, a landscape architect, are replacing asphalt driveways and other hard surfaces with permeable ones, like gravel or crushed granite, and replacing lawn with terraced beds filled with plants that not only can take heat and drought but also absorb and hold water.

“I’ve done it passively, instead of actively with a cistern,” said Ms. Ten Eyck, 52, standing by the live oaks in front of the 1950s bungalow in West Austin that she shares with her husband, Gary Deaver, 65. “The whole idea was to slow the rainwater down, because we’re about eight feet higher than the street.”

In place of her old driveway and flagstone paving, crushed decomposed granite planted with small blue-green agaves now surrounds the oaks, allowing air and water to reach tree roots. Ms. Ten Eyck also replaced the lawn with natives, including groves of Texas persimmon trees and drifts of Mexican feather grass billowing over Berkeley sedge, mounds of tall joe-pye weed and clumps of Mexican orchid tree, all stepped down the slope.

Giant blue agaves (*Agave franzosinii*) as big as economy cars greet visitors walking through the front gate. These Mexican natives love the heat, and they don’t need any water.

ON the east side of the city, the same native plants that fill the Stanleys’ green roof are sending down much deeper roots in the Mueller Prairie, a restored 30-acre fragment of the Texas Blackland Prairie, which once sprawled across 15 million acres.

Mark Simmons, a restoration ecologist who orchestrated the seed mix and plantings here, calls it

“one of the most endangered ecosystems in North America,” because “there are a few thousand acres, or one-tenth of 1 percent left.”

Mr. Simmons, 50, is the director of the Ecosystem Design Group at the Lady Bird Johnson Wildflower Center at the University of Texas and is working with RVi, a design and landscape architecture firm here, to bring part of this prairie back to life.

The native grasses, he said, can sequester more carbon than trees: “As the roots die, that organic carbon gets locked up in the soil and can stay tens of thousand of years — a lot longer than the lifetime of a tree trunk, which falls down and rots, releasing carbon into the air.”

Once buried under the Robert Mueller Municipal Airport, the land is now one of the public parks in a huge 700-acre mixed-use project being built downtown by the Catellus Development Corporation.

Other projects Mr. Simmons is working on include advising people like the Stanleys on how to use native plants on a green roof, and developing a native turf grass that doesn't have to be watered or mowed, thus saving energy and reducing the production of greenhouse gases.

“You can have a nice green lawn if you water every two weeks,” he said. “But if you don't water, it goes dormant and turns brown. It's not the end of the world.”

Mr. Simmons, who grew up in Cornwall with a lush English lawn, recalls all the time he spent playing behind the verdant hedge. “Why would you want to take that away?” he said. Particularly when there are already “40 million acres of lawn in this country.”

Instead of trying to persuade Americans to rip up their lawns and grow vegetables, Mr. Simmons is proposing a radically different kind of ground cover: a mix of seven native species, including buffalo grass, blue grama, Texas grama and curly mesquite.

Because each grass has different needs and habits, it fills a particular ecological niche, and the right matrix of plants keeps diseases from spreading and shuts out weeds, so pesticides are rarely necessary. Native grass also has roots that go down 30 feet, finding water when there is none to be had aboveground.

He isn't content with just revolutionizing turf grass, though. He's out to change our very perceptions of what makes an appealing landscape.

“We have this expectation, left over from the Victorian era, that everything has to be green,” Mr. Simmons said. “But we have savannas here, dark evergreen trees and grass like Africa that turns brown in the dry season. That's the nature of plants.”

The Mueller prairie was brown — even crispy — that August morning, as Mr. Simmons recalled its

rebirth from a parking lot at the old airport.

“When we lifted up the hardscaping in 2008, the rich Blackland clay soil was still there,” he said. “So we stockpiled it while we sculpted the land.”

The compacted soil had to be ripped up, tilled 20 inches down and graded so that the land sloped away from the new houses built across the street to a catchment pond in the middle of the greenway, where storm water is cleansed by native cattails, mallows and other wetland species. The stockpiled prairie soil was then spread over the graded land, with a layer of low-nutrient compost (these plants don't need extra nitrogen) to encourage germination. Finally, dozens of species of native grasses and wildflowers were hydro-seeded across the plain.

Early pioneer species, like sideoats grama and green sprangletop, began sprouting, enriching the soil and providing a bit of shade for later species, like Indiangrass and big bluestem. But it was a slow, scruffy process, and residents in the new community began to complain.

“People were asking: ‘What are all these weeds? Why aren't we mowing?’ ” Mr. Simmons said. So he started giving talks to the community, and his team gave tours and handed out educational material.

“Six months later, when we decided to mow, to make the wildflowers show up better in the spring, we got all these calls saying, ‘Why are you mowing down our prairie?’ ” he said.

Bird populations have increased, as grasses and trees provide food and shelter.

“We have a lot of ducks on the pond,” said Janelle Dozier, 58, who moved here with her husband, Don, 64, in 2008. “In the evening, purple martins like to fly over it and catch the bugs.”

Ms. Dozier helped start the Friends of the Prairie, a group of about 70 volunteers who help weed and maintain the area. Such interaction of people and prairie is crucial, Mr. Simmons said.

“Restoring a prairie isn't just ‘Design a landscape and presto, you've got it,’ ” he said. “It's a long trajectory, and you need people to help guide it along, which isn't a bad thing, because then they value it.”

Earlier this week, as days with triple-digit temperatures added up to Austin's hottest summer on record, Mr. Simmons took a measured but optimistic view.

“It's likely that this is going to happen again. Hot summers aren't ever going to leave us,” he said. “But if we just search in our local flora for the right plants, we can create drought-resistant, regenerative landscapes.”

Regenerative seems to have replaced sustainable as the new buzzword.

“It means landscapes that give back,” he said. “Which is what green roofs and prairies do.”