Desert prophet of new food crops

For 40 years Richard Felger has promoted native plants to feed the Southwest

GARY PAUL NABHAN

Richard Felger has always been a little ahead of his time. Even before he was a teenager in southern California, he cultivated rare cacti and orchids at home, and kept three alligators in his bathtub. Before he graduated from the University of Arizona, he shadowed some of the world's greatest desert ecologists. On his first trip down to Alamos, Sonora, he realized what would drive his career: the Sonoran Desert was full of wonders, and some of them were delectable.

Within a few years, Felger had suggested that we design farms to mimic desert ecosystems. In several papers published in the late 1970s, he and his colleagues pioneered a way to identify new crops for arid lands. He proposed for domestication those desert plants that would be most reliable for producing food, with the least irrigation and tillage.

The Sonora Desert natives that Felger initially proposed be cultivated included mesquite, agaves, fruit from organ pipe and prickly pear cactus, tepary beans, chiltepin peppers, grain from a saltgrass called "nipa," amaranth, and oil from buffalogourd seeds. Felger predicted that agriculture in the Sonoran and other deserts would soon need to be restructured from the bottom up. His vision was to "fit the crop to the prevailing environmental conditions rather than trying to remake desert environments to fit temperate, water-hungry crops." He and his colleagues proposed that farmers plant native, drought-hardy crops in mixtures of species, mostly perennials. Unlike the Land Institute's efforts with new prairie crops, Felger chose not their lengthy domestication and hybridization, but instead to find wild species and a few common cultivated desert land races that seemed "ready to go" for arid farming. They could efficiently use harvested rainwater, rather than the pumped groundwater required by conventionally recommended crops – cotton, alfalfa, pecans, citrus, lettuce.

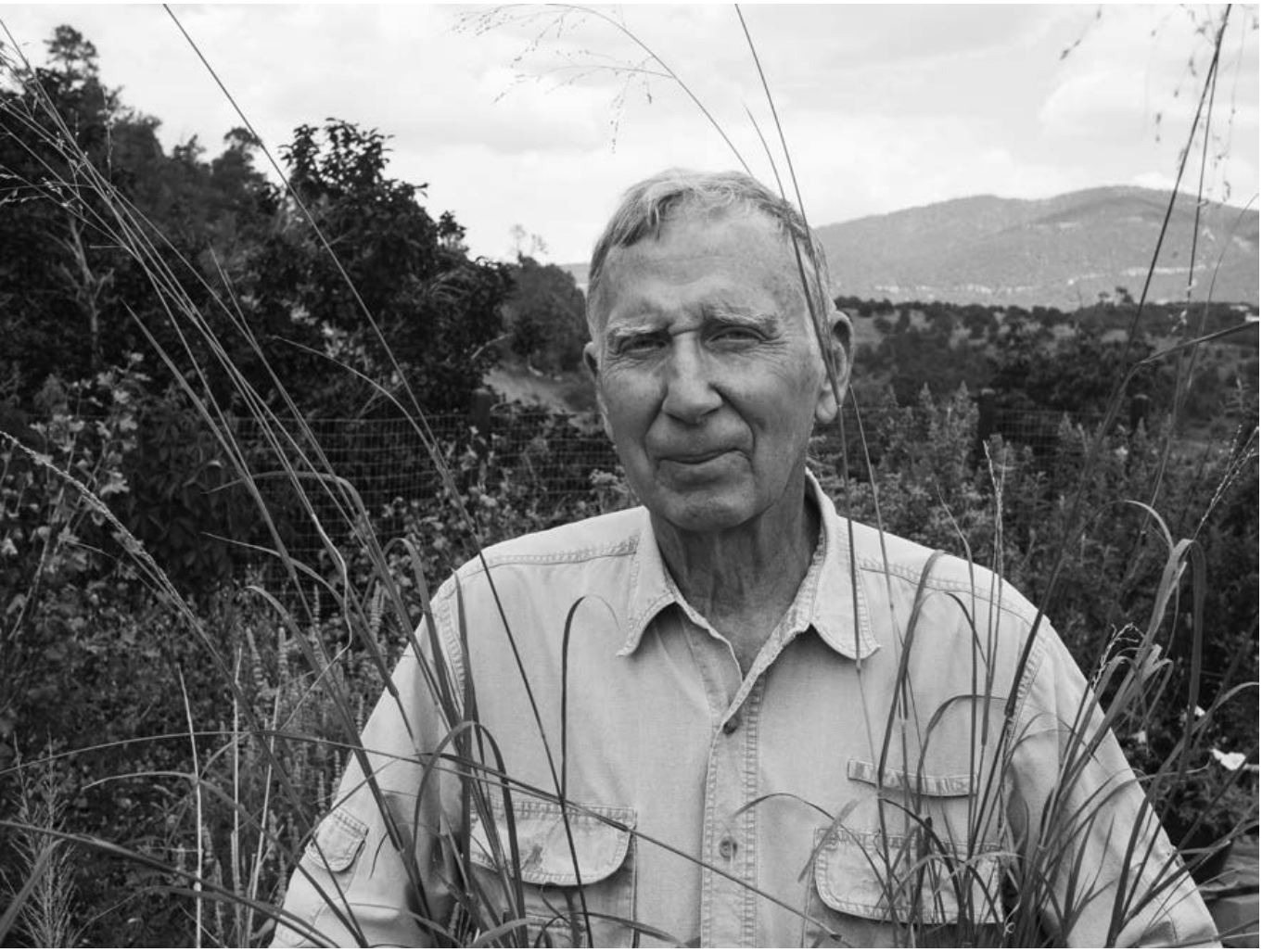
But his message was largely ignored, if not outright dismissed, by most of the crop scientists working in the same arid region.

Now many Arizonans wonder why mainstream crop scientists didn't listen to him sooner. With groundwater levels plummeting across the desert Southwest, and the Colorado River's reservoirs reaching the lowest levels since it was first dammed, both water rationing and steep price increases for irrigation are kicking in. Desert-adapted crops are needed more than ever. Felger recognized the Sonoran Desert's apparent barrenness as "deceptive," and showed how its residents could enjoy a level of local food security unknown for decades.

Although Felger began his career as a desert herpetologist, he soon gained renown as the Sonoran Desert's most knowledgeable

botanist, writing regional floras and describing new species or novel uses of well-known ones. It was his earliest work describing the historical uses of plants by the Seri Indians that transformed his research into a quest for future food crops. The Seri demonstrated to Felger not only that these plants were edible, but also that they were delicious.

Though familiar with the Sonoran Desert's overall plant diversity, he chose to focus on a few of its edible species – including two that were wild-harvested by the Seri and their Mexican neighbors – for their potential to become crops in arid climates. His technical papers adorned the covers of prestigious science journals, but at times were



Early in his career Richard Felger began arguing that we design farms to mimic desert ecosystems. He has finally seen several of the native plants he championed make their way to market. Photo by Bill Steen, who with his wife, Athena, directs the Arizona-based Canelo Project, "connecting people, culture, and nature." They have written books about building with straw bales and natural materials.

more widely celebrated beyond the Sonoran Desert than within it.

Most field crop scientists in the Southwest's land grant agricultural colleges dismissed Felger's radical suggestions, and that future water scarcity might drive into obsolescence the furrow irrigation of food crops adapted to temperate climates. They could not imagine that accelerated climate change might make the desert hotter, drier, or more saline.

Audience or no audience, grants or no grants, Felger has continued desert food studies for well over half of his life. A youthful-looking 81, he exudes whimsy and humor, refusing bitterness over lack of recognition by his peers. He is hopeful, not cynical: "The usual complaint about new crops you hear when you talk with well-funded institutions or government programs is that most of native desert crops are not well-suited for industrial scale harvesting and processing. The agricultural industry still turns its nose up at the idea of new crops. It doesn't want to fund their development unless it can acquire all proprietary rights to the species, which I will not and cannot offer."

But the times – and the climate – are changing. And Felger has found new, more receptive audiences: "Last year, when I spoke at the conference of the New Mexico Organic Farming Alliance, I realized that hundreds of small-scale farmers fully get what I am trying to do. They are eager to participate because of the challenges they are currently facing, … and are helping me get these promising crops evaluated under field conditions on their own farms."

Felger now realizes that his food crop candidates are not only to solve some of the most pressing problems facing desert agriculture, but that their edible, delectable heritage food products are highly marketable: "Most of the world has recognized by now that there will soon be no cheap water for irrigating crops, nor cheap fossil fuel for tillage. Many farmers actually want to transition to no-till. And now, there's a vibrant locavore movement that is willing to pay for sustainably grown foods. These various threads are being woven together."

When I tracked Felger down in his recently adopted hometown of Silver City, New Mexico, I asked him to document which of the food crops he proposed in the 1970s had already hit "pay dirt" – that is, which crops were being grown commercially. Still active and prolific in describing desert floras, and evaluating native plants for potential domestication, he had never taken a breather from his work long enough to calculate his batting average. Together we looked back and found that five out of six of his first candidates have already been enthusiastically adopted by farmers and chefs.

It may be hard for contemporary Southwest foodies to recall, but in the mid-1970s, foods like mesquite flour, prickly pear fruits and syrups, dried tepary beans, chia seeds, popped amaranth grains, and agave nectar were virtually unknown in the American marketplace. Amaranth seeds and greens, prickly pear pads (nopalitos) and fresh fruits (tunas) were widely available in Mexico, but they were often looked down upon as "poor people's" survival foods.

While not directly involved in their commercialization, Felger was among the vanguard of those who elevated the status of such foods. Through dozens of lectures and popular magazine articles, he brought Mexican scientists, chefs, and innovators to take more pride in the cultural heritage, nutritional quality, and flavors of their ancient foodstuffs. Interest in the United States eventually grew as well, with the likes of

the National Research Council, the Rodale Research Institute, and Friends of ProNatura taking heed.

Today, amaranth grain, tepary beans, and chia seeds are ubiquitous in health food stores, as are agave nectar and prickly pear syrup. Mesquite is not only being grown as a tree crop for food and wood by the Arizona Mesquite Company, but nearly a dozen hammer mills and several festivals help Arizonans to process their own wild-harvested mesquite pods.

Additionally, the Seri Indians, from whom Felger first learned about mesquite's food value, have had their traditional fire-roasted mesquite flour boarded onto the Slow Food International Ark of Taste, the only global list of imperiled or neglected foods. It is now featured at the Mitsitam Cafe at the National Museum of the American Indian on the Washington Mall, and in bars and coffee shops in Tucson.

When Felger first wrote on Sonora's several agave species, including water efficiency double that of maize, making mescal from them was strictly bootleg. But within a decade of his first publications in Sonora, scientists and farmers there were emboldened to bring at least two native species of Sonoran Desert agaves into cultivation in sizeable plantations. At least four brands of Sonora's mescal bacanora are now sold in Arizona, and most of them now use cultivated rather than wild plants.

When Felger and his colleagues began to evaluate the chiltepin as a potential food crop, the entire harvest coming into Arizona from Sonora was wild-harvested. Soon, Sonoran innovators such as Alfredo Noriega and Manuel Alberto Lopez had carefully selected from diverse wild foundation seeds those that would do best under cultivation. Now cultivated chiltepin sales sometimes exceed that of wild-harvested chiltepins.

If there is any take-home message from Felger's work over the past four decades, it is that innovations in our food systems most often emerge from creative people on the margins, not from the biggest, wealthiest research institutions or agribusinesses. This clearly rings true for The Land Institute. It was Felger's deep familiarity with desert plants and ecosystems that enabled him to envision an alternate future for food crops in the arid Southwest.

Felger is now partnering with Silver City neighbor Gregg Dugan, a tree crop specialist who helps advance no-till production of perennial food crops in permaculture systems. They work with several farmers on Arizona Indian reservations, in Sonoran villages, and in New Mexico farm towns to get crops like mesquite and Apache redgrass cultivated on a larger scale. Their work was recently supported by a specialty crop grant from New Mexico's state government – the kind of award that was never granted to Felger during his 40 years of promoting the same crops in Arizona.

But the question in Felger's story is not how visionaries like him secure funding and recognition for their innovations that may benefit society. Rather, it is this: Are we desert dwellers ready to eat a diet that features crops suited to our arid environment, or will we continue to see the desert depleted by the furrow irrigation of water-guzzling and largely unsustainable food and fiber crops? This choice is ours to make.

Gary Paul Nabhan has written several books about agriculture and food, including "Growing Food in a Hotter, Drier Land: Lessons from Desert Farmers on Adapting to Climate Uncertainty" and "Food, Genes, and Culture: Eating Right for Your Origins." Forty years ago he began his work on desert foods as Richard Felger's intern and research assistant. The photo of Nabhan is by Dennis Moroney.