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How farming perennial crops can help us in times of climate change, food insecurity and social division

Climate change is threatening modern life in ways we are still finding, from food security to the economy to everyday living. It has been labeled a “threat multiplier” for its potential to complicate geopolitical relationships. And our efforts to adapt as a global society face obstacles brought on by inequality.

“I’m really feeling the weight of so many crises,” said Liz Carlisle, a professor in the Environmental Studies Program at UC Santa Barbara. Between trying to slow down emissions and tackle future climate change while trying to handle the effects we’re already seeing and heal the deep divisions in our society, she said, coming together to solve a collective challenge like climate change is a herculean task.

But Carlisle, whose research focuses on food and farming, said there is a way to make inroads into the problem, and the solution could be right under our feet. In her book, “Living Roots: The Promise of Perennial Foods” (Island Press, 2026), Carlisle and co-editor Aubrey Streit Krug assert that relying more on perennial crops can help ease the many difficulties of adapting to a changing climate.

“I came to perennial foods because I see these foods and the movement building around them as this really promising solution that can help us to tackle these

collective challenges," she said.

Farming for resilience

Perennials are already a staple in most people's diets. Consider that nuts and fruits come from trees and shrubs, which produce year after year without the tilling, uprooting and replanting required for annual crops like wheat, corn and soy. The key, said Carlisle and Streit Krug, director of the Perennial Cultures Lab at The Land Institute in Kansas, lies in their roots: Perennial plants invest more energy into developing their root systems than their annual counterparts, allowing them to regenerate and persist. Not only can they be an abundant source of food, the way they are grown minimizes climate-warming emissions. Globally, agriculture and industrial food systems currently produce about 16-17 billion metric tons of carbon each year; that's about a quarter to a third of global carbon emissions.

Through a collection of more than 30 essays and poems, Carlisle, Streit Krug and their contributors build a picture of the perennial food movement in the United States and abroad. Some are farmers who plant perennial crops. Others are academics with specialties in ecology and climate adaptation. Several are Indigenous, with an intimate knowledge of the crops that have sustained their people for millennia. All are lovers of the land and assert that perennial farming is easier on the Earth, not only producing a diverse array of foods but also helping to keep conditions balanced and resilient, while contributing to culture and a common cause.

"I feel like I have this incredible privilege of getting to know these really inspiring people who are working from all these different and rich cultural traditions and have a rich set of motivations as well, around the future of their communities and their health and environmental concerns," Carlisle said. From the plains of the United States to the pampas of Argentina, from the grasslands of Australia to the highlands of Turkey to the fields in Uganda, the tellers of these stories reflect on the relationships of their communities to the perennial plants of their regions. One of the goals, according to her, is to demonstrate that there's a place in the perennial food movement for everyone, from farmers looking for a less intensive way to grow crops to consumers seeking to be more Earth-friendly with their choices.

“I certainly don’t think we should eliminate annual plants as a food source, but when I look at the share of perennials in our managed ecosystems and our farms, you can see that the way many of us are farming — often with nothing but annuals — is not as resilient as what nature is doing,” Carlisle said.

In addition to producing food, the ecosystems in which perennial crops are grown confer resilience in other ways. Because perennials produce year after year, the labor, cost and energy that goes into tilling the soil is reduced, which maintains soil health and reduces erosion and the need for fertilization. Deep-rooted perennials also can help manage flooding and these

same deep roots can store massive amounts of carbon underground. In their native environments, these plants are also able to withstand the droughts and heat stress that could take down shallower-rooted plants.

Easy strategies

It’s not difficult to join the perennial food movement, according to Carlisle. “A really easy first step is thinking about who locally is growing tree nuts and fruits in sustainable and regenerative ways.” These crops are widely available throughout the U.S. and most of the world, which could make for simple food decisions.

“If you eat meat, another step is to think about who’s producing meat locally from perennial pastures as opposed to from confined animal feeding operations,” Carlisle continued. “That’s a huge step toward perennial landscapes and it has a lot of co-benefits as well.

“As we move forward, what we need to do is develop a much wider array of crops that are better adapted to diverse environments under diverse circumstances,” she added. “We want to be food secure today, but we also want future generations to be food secure, and farm in a way that’s not undermining the very resources that make farming possible.”

Tags
Climate Change

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