



"Plants under a solar array get less sun early in the day, but don't go through the depression midday, which is a net win," says Barron-Gifford.

Tests Show Yield Boost Under Solar Arrays

While some fear that large solar arrays will negatively impact food production, the University of Arizona suggests the opposite can be true. For the past 12 years, Greg Barron-Gifford has been combining agriculture and photovoltaics (solar panel-generated energy) in a concept called agrivoltaics. He's been testing the concept in Arizona, at a Colorado

farm called Jack's Solar Garden (Vol. 47, No. 3), and in Kenya and Mexico.

Among his findings was that plants as an understory reduced the heat island that naturally forms around solar panels and reduces their efficiency. He also found that the same heat island allowed plants that normally would not have survived to survive through

the winter and increased yield.

"We started trying to understand how solar arrays can increase yield," says Barron-Gifford. "We developed a device to measure photosynthesis and measure how much photosynthesis is taking place on an hourly basis."

The researcher reports that plants in full sun, especially in dryland, kick photosynthesis in full gear early in the morning. However, unless irrigated, they experience a midday depression. That wasn't the case for the plants under the array.

"Plants under a solar array get less sun early in the day, but don't go through the depression midday, which is a net win," says Barron-Gifford.

The research examined basil harvested for its leaves, as well as tomatoes and dry beans. One unexpected finding was that plants in semi-shade tend to grow taller and produce larger leaves as they reach for the sun. The team evaluated the impact on yield.

"While all three would've produced more yield in full sun, it would've required irrigation," says Barron-Gifford. "Water stress was reduced in the plants under the solar arrays. We saw statistically significantly more photosynthesis and yield in the tomatoes and beans, and the basil leaned that way."

The research team examined a variety of agrivoltaic systems, including elevated and



Leaf on left grown under solar array; leaf on right grown in full sun.

row-based systems. They also looked at growing food crops, cover crops for grazing, and succulents such as prickly pear and agave. Carrots were successfully planted several months ahead of the normal planting time.

"In all cases, we saw increased production in agrivoltaic settings," says Barron-Gifford. "While the plants weren't necessarily cooler, the soil was. As a result, the effect of every irrigation or rain event lasted longer — 10 days instead of 2."

In drought-prone areas or areas where irrigation water is scarce, farming under solar arrays may become a high-value practice.

Contact: FARM SHOW Followup, School of Geography, Development & Environment; Biosphere 2, University of Arizona, Tucson, Ariz. 85721 (ph 520-548-0388; gregbg@arizona.edu; www.salsav.org).



Museum is considered the nation's premier institution dedicated to the history, art and culture of the American West.

National Cowboy Museum Offers Updated Experiences

The National Cowboy and Western Heritage Museum in Oklahoma City, Okla., offers an interactive, wide-ranging snapshot of the American frontier.

"The Museum's story began in the early 1950s with Chester A. Reynolds, a former president of Lee Jeans, who was concerned that America was beginning to lose touch with its Western heritage," says Kerrie Booher, Director of Marketing and Communications. "He envisioned a national institution that would preserve and celebrate the people, art, history and traditions of the American West."

A number of cities sought to host the museum, but Oklahoma City won the honor and opened its doors in 1965. Today, the museum is regarded as the nation's premier institution dedicated to the history, art and culture of the American West.

"More than 10 million people have visited the museum over the years, and our collection has grown to more than 35,000 Western and Native American artworks and historic artifacts," says Booher. "While our roots are very much in preserving cowboy heritage, the story we tell today is much broader; it's the evolving story of the West and the many people, cultures and traditions that have shaped it."

The museum has undergone extensive renovations since 2018, including a \$15 million, 100,000-sq ft outdoor educational activity center and an overhauled art gallery.

"Our goal is not to change the stories we preserve, but to continually improve the way we tell them and make those stories more engaging and accessible for today's visitors," says Booher.

The outdoor educational experience, called Liichokoshkomo, a Chickasaw phrase meaning "let's play," is designed around the idea that children learn differently when they can get their hands on history. Within it, families can engage with exhibits featuring Native American dwellings, a prairie sod house, a train depot and a trading post; load a pioneer wagon; grind corn; and participate in other hands-on activities.

"The space helps children understand that the West was shaped by many different people and cultures while allowing families to experience that history together."

Other recent improvements include Find Your West, a permanent 3,000-sq ft immersive experience opened in 2024 that uses projection mapping and other technology to introduce visitors to cowboy, Native American, ranching and rodeo cultures.

"That was an important step in bringing

more technology and interactivity into the museum," says Booher. "We've also launched our Heart & Soul initiative, our most ambitious curatorial undertaking in decades. We're systematically reimagining those spaces with stronger storytelling, clearer organization and wayfinding, updated graphics, multimedia and hands-on experiences."

Likewise, the National Rodeo Hall of Fame, formally known as the Lynn Hickey American Rodeo Gallery, has undergone extensive renovations.

"Rodeo has been central to the Museum since its founding in 1955, and the redesigned gallery will connect the sport more directly to its roots in ranch work and the practical skills of the working cowboy, while tracing its evolution into today's professional rodeo and Western sports industry," says Booher.

"The new interpretation will also broaden the story to explore the many people and traditions that shaped rodeo. Important artifacts from our collection, including saddles, trophies, historic photographs, and objects associated with some of rodeo's legendary figures, will be paired with multimedia and interactive elements to tell a more complete story of the sport, its champions, and its enduring place in Western culture."

Other improvements focused on commemorating bull riding's history and the diversity of Native Americans.

"All improvement projects are part of a broader effort to make the Museum more immersive and cohesive, while keeping our extraordinary collection and the authentic stories of the people who shaped the West at the center of the visitor experience."

For a limited time, the Museum offers access to a 40-min., 360-degree cinematic experience, created in collaboration with

Lighthouse Immersive.

"The Cowboy: An Immersive Journey" is a unique way to experience the story of the American West," says Booher. "Instead of watching a film on a traditional screen, visitors are surrounded by enormous projections, historic imagery, sweeping landscapes, music and sound."

The film covers everything from the origins of cowboy culture to cattle drives, rodeos and Wild West shows, and to the continuing influence of cowboy culture in Hollywood and beyond.

"Visitors hear the cattle, see landscapes unfold around them, and feel as though they have stepped inside the story."

The experience, which premiered at that museum in early 2026, returned July 25 for its second engagement before traveling internationally. This separately ticketed experience offers multiple showings throughout the day.

"First-time visitors are often surprised by the scope of the museum. They might expect a cowboy hall of fame, then discover world-class Western art, Native American art and culture, working-cowboy history, rodeo, firearms, Western film and television, a historic prairie town, sculpture gardens and outdoor educational experiences," says Booher. "We also have extraordinary collections tied directly to the working West. The museum holds some of the world's most extensive collections of saddlery, barbed wire, early rodeo trophies and American rodeo photography."

She suggests that new visitors budget at least 3 hr for exploring the museum.

Contact: FARM SHOW Followup, National Cowboy and Western Heritage Museum, 1700 N.E. 63rd St, Oklahoma City, Okla. 73111 (ph 405-478-2250; www.nationalcowboymuseum.org).

Easy Way To Send Your Ideas

How often do you see an idea when you're out and about and say, "Hey, that should be in FARM SHOW"? Next time that happens, just take out your phone and send us a photo or two. Just text them to us at **952-465-5019**. If you want to leave a voice mail explaining what you're sending, this phone is dedicated to FARM SHOW stories so it's on and available 24/7. No need to worry about disturbing anyone. Call or text day or night with your ideas, comments, or suggestions.

