

Perennial Rice Now A Reality

Two decades of research and development by The Land Institute and its domestic and international research partners have made perennial rice a reality. The new paddy rice variety is taking off across Asia and into Africa, Bangladesh, the Philippines, and other test regions. Since 2018, three cultivars have been released in China to more than 44,000 perennial rice farmers.

“It’s achieved 4 years of perenniality with two crops a year,” says Tammy Kimbler, The Land Institute. “Yields are on par with conventional rice harvests.”

The new rice has not yet been approved by the USDA. When it is, the tropical rice will be suitable for Florida and the Gulf regions.

Reduced labor with the perennial rice is a huge benefit to areas with small farms and limited mechanization. However, even in the highly mechanized U.S., the rice has significant benefits in soil retention and carbon sequestration.

The Land Institute has made developing perennial crops a central component of their regenerative farming efforts. Developing Kernza from native wheat grass was their first significant success. While research continues into that crop, it has moved from plots to farm fields and is being commercialized in brewing, baking, and other food products.

Unlike Kernza, perennial rice is a cross between a domesticated Asian rice and a wild rice relative from Africa. Kimbler explains that mapping the genome for rice was key to the project’s success, as it was for Kernza. Going forward, it will speed up the development of other varieties.

“Once you have a perennial variety that’s functioning, you can select within its genetic



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diversity for alternative seed size and other characteristics,” says Kimbler. “Currently, they’re working with paddy rice. We’re very interested in upland rice for a host of ecological impacts associated with paddy rice.”

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Pop-Up Solar Panels Charge Vehicles, Tractors

With increasingly heavy demands placed on the electrical grid due to more electric vehicles and equipment, Tom McCalmont of Paired Power developed the idea of the “Pair Tree,” a pop-up solar canopy to charge electric vehicles and agricultural equipment without using the standard grid.

“A farm’s electrical boxes often don’t have much capacity and tend to be in places where the grid isn’t very strong,” says McCalmont. “It’s a barrier to farming with electric vehicles because they generally require more power than the farm can deliver. Our canopy gives them a realistic option.”

He explains their 14 by 18-ft. Pair Tree solar panel has a height of 10 ft., so there’s room underneath to charge large equipment. It can also be used for charging swappable batteries, plus features electrical storage capabilities. The system provides about 5 kW of power and 42 kW hours of energy which is enough for light farming applications, including small tractors, electric wheelbarrows, sprayers and mowers.

“Charging practicalities depend on the farm,” McCalmont says. “A piece of equipment can charge when it’s not in use, or we can charge interchangeable batteries so a tractor can be working, then come back and switch to the fresh battery.”

While the Pair Tree project was announced just last fall, McCalmont says interest and demand are quickly ramping up. The first deliveries were planned for June 2023. In the future, he envisions the canopy technology expanding for use with larger tractors plus cars, ATVs, UTVs, and other electrically powered equipment.

Pair Tree components are gathered and assembled at the company’s California



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headquarters.

McCalmont estimates that for a winery or medium-sized farm, the cost would be around \$70,000.

“First, while this may seem like a lot, many incentives are available to bring the cost down,” he says. “Secondly, you’re not buying energy, so over the life of the system, let’s say 20 years, all the fuel is free. It’s a dramatic savings.”

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Once pulled to the desired location, transit dollies lower the T-bin to the ground. The 8-ft. high roof with an 18-gauge seam-sealed roof tarp and 36-in. top opening is telescoped into place.

Mobile Bin Goes Out To The Field

T-Bin goes wherever you need storage. Detachable hydraulic lifting motors raise and lower the upper bin, while the telescoping roof pole raises the roof into place.

“The T-Bin holds up to 10,000 bushels of grain, wherever and whenever extra storage is needed,” says Pat Beaujot, T-Bin. “Once emptied, take it down in less than 10 min. and move it to another field.”

Beaujot and fellow farmer and agribusinessman Dave Kosior worked on the concept for 3 years before introducing the T-Bin. They had two prototypes built as part of the process.

One challenge was getting the in-transit bin under the 17-ft. height limit for public roads. Kosior had experience tipping bins and hauling them to new locations. He knew anything over that required permits from the power company to move. When a farmer suggested he follow the combine with a bin and tip it up in the field, it got him thinking. He brought his idea to Beaujot.

“I had done a lot of work in manufacturing and design and was retired, but the idea caught my eye,” says Beaujot. “It took about a year of noodling with sketches, and then we started building a 5,000-bu. version in Dave’s shop.”

Two years ago, the pair, along with Trevor Phenix, a young engineer, built a full-scale version and took it to two shows. “We got a good response,” says Beaujot.

What the three had come up with was a 16-ft. 11-in. high transit system with a 27-ft. diameter set of nested bins with structural I-beam legs and hollow structural steel bracing. The inner hopper bin is a fixed-in-place steel ring with an 8-ft. deep cone floor. The 14-ft. high outer bin is designed to be lifted into place. A triple skid base ensures stability for the bin in transit and at the T-Bin’s 36-ft. working height.

Once pulled to the desired location, the transit dollies lower the T-bin to the ground. The 8-ft. high roof with an 18-gauge seam-sealed roof tarp and 36-in. top opening is telescoped into place. Roller chains on

alternate legs raise the outer steel bin into place. As it lifts, it grabs onto the top of the inner bin, and the two seal together with the help of retractable steel support arms.

The initial thought was the T-Bin could be an alternative to grain bags as temporary storage. Beaujot acknowledges the price of \$140,000 CAD is high for a 10,000-bushel grain bin. However, he points to the losses of moving grain into and out of a bag, as well as animal damage to the bags and their one-time use.

Beaujot also points out that transit dollies can be used with multiple bins. That drops the cost of bins to \$80,000 each, given the \$60,000 cost of the dolly set. Even without additional bins, Beaujot is confident the T-Bin will pay for itself as a buffer to grain transfer.

“Should something go wrong with a semi, or it’s delayed unloading, the combine won’t have to shut down waiting to unload,” he says. “It can also eliminate the need for an extra semi and driver. At \$200,000 for a used semi-tractor and double trailer, you’ve more than paid for the T-Bin.”

While the metal fabricator who built the final prototype could build them to order today, Beaujot and his partners want to gather more user testimony before going into full production. They’re also hoping to find a buyer for the company T-Bin.

“We don’t really want to start a company to produce them; however, if we could find the right partner, we’d turn it over to them,” says Beaujot. “We’ve already had some interest from manufacturers of steel hopper bins.”

While looking for someone to take it to the next level, the concept team is already looking at a farmer-identified need. Currently, the design requires an auger to be brought to the site for loading and unloading the bin. This requires a second driver and tractor.

“In the future, we could easily find a way of connecting the T-Bin to a load and unload auger,” says Beaujot.

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