



Feed the Future Country Fact Sheet

Online Version: <https://feedthefuture.gov/article/global-research-partnership-demonstrates-potential-reduce-environmental-impact-rice>

Global Research Partnership Demonstrates Potential to Reduce Environmental Impact of Rice Production

Since the early days of Feed the Future, the initiative has supported international efforts to develop and disseminate [improved, higher-yielding rice](#), called “New Rice for Africa,” or NERICA. NERICA rice varieties are the result of crossing African and Asian rices. This year, biotechnology researchers took another step toward improving rice for African smallholder farmers by inserting a gene that confers increased nitrogen use efficiency into NERICA rices.

The new nitrogen-use-efficient varieties are important because roughly 90 percent of the land African farmers use to grow rice is deficient in soil nitrogen, which seriously limits crop yields. As a result, Africa imports nearly 9 million metric tons of rice each year – roughly one third of the rice consumed on the continent.

By taking better advantage of scarce soil nitrogen, the new varieties could enhance yields in Africa’s nutrient-poor soils. And by reducing the amount of fertilizer farmers must apply to produce good yields, the nitrogen-efficient rice also has the potential to reduce the climate impacts of rice farming. Globally, rice production accounts for nearly 16 percent of total fertilizer use; nitrogen fertilizer in particular is one of the largest contributors to greenhouse gas emissions from agriculture.

The early results of this effort are promising. This fall, researchers at the International Center for Tropical Agriculture (CIAT) announced that the transgenic variety (i.e. a genetically modified organism) out-yielded conventional rice by 22-30 percent under low-fertilizer conditions in a two-year field trial in Colombia. National research partners in Ghana and Uganda also initiated the first-ever African field trials of transgenic rice, and are testing whether the new lines show a similar advantage in African soils. These advances mark an early but significant technological step toward improved productivity for African rice farmers, as well as toward potentially reducing the climate impacts of rice production.

This latest success is made possible by a vibrant, ongoing global partnership between private-sector biotechnology firms, international and national agricultural research institutions, non-governmental organizations, and the U.S. Government. With support from Feed the Future, California-based Arcadia Biosciences donated the intellectual property to generate improved varieties and introduced the nitrogen use efficiency trait into NERICA rice before transferring the initial lines to CIAT for field testing. Arcadia and CIAT also produce and ship the genetically engineered seed to research partners in Ghana and Uganda. Meanwhile, the African Agricultural Technology Foundation coordinates activities across the partnership, helping navigate intellectual property and biosafety regulations and ensuring that the trials adhere to legal and environmental standards.

As the African field trials progress, Ghanaian and Ugandan researchers will identify which of the new, nitrogen-use-efficient rice lines perform best under local conditions. The researchers then plan to optimize the best-performing lines through conventional breeding and introduce the improved traits into locally adapted, farmer-preferred rice varieties. The partnership is also working to insert additional genes that confer salt tolerance and water use efficiency into the same rice varieties in order to further improve its productivity under African field conditions.