

## **Arcadia Biosciences and Chinese Province Agree to Establish Methods for Carbon Credit Trading Based on Nitrogen use Efficient Rice**

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### **-- U.S./China Collaboration To Develop New Model For Lowering Greenhouse Gas Emissions By Reducing Nitrogen Fertilizer Use --**

**Davis, Calif. (May 3, 2007)** – Arcadia Biosciences announced today that it has agreed with the government of the Ningxia Hui Autonomous Region (Ningxia) of China to establish the groundwork for a carbon credit methodology applicable to rice crops. Such a system represents a novel way to significantly reduce greenhouse gases through the adoption of Nitrogen Use Efficient crops by growers. Arcadia will work with the Ningxia Academy of Agricultural and Forestry Sciences (NAAFS) to develop the methodology.

Beginning in April 2007, the start of the region's rice planting season, Arcadia and the NAAFS will conduct field experiments in Ningxia to quantify baseline greenhouse gas (GHG) emissions from rice cultivation, as well as reductions in GHG emissions resulting from reduced application of nitrogen fertilizer. These experiments will be designed to be consistent with the procedures of the United Nations Framework Convention on Climate Change Clean Development Mechanism. The Convention's primary goal is to reduce atmospheric GHG concentrations to non-threatening levels.

The impact of agriculture on climate change through GHG emissions has not been widely addressed. According to data from the World Resource Institute Climate Analysis Indicators Tool (CAIT), agriculture is the second-largest industrial source of global GHG emissions. Agricultural GHG emissions are less than energy/heat production, but greater than the entire transportation sector. Agricultural GHG emissions are predominantly in the form of nitrous oxide, which has a global warming potential nearly 300 times greater than carbon dioxide. Agriculture is responsible for 84 percent of global nitrous oxide emissions. The widespread use of nitrogen fertilizer, less than one-half of which is typically absorbed by crops, is estimated to directly account for approximately one-third of agricultural GHG emissions. This is before any consideration of emissions associated with the production and transportation of nitrogen fertilizer, which Climate Analysis Indicators Tool (CAIT) Version 4.0. Global CO<sub>2</sub> emissions by sector, not including land use change. World Resources Institute, (2006) uses natural gas as a primary input.

Arcadia has developed and demonstrated Nitrogen Use Efficiency (NUE) technology that enables plants to maintain high yields while requiring 50 percent to 60 percent less nitrogen fertilizer. Considering global population growth trends and the need to increase food production proportionately, NUE technology can be an important tool to help minimize the impact of agriculture on global warming.

Rice is a compelling crop for NUE technology because of its importance as a staple food crop for a large percentage of the global population. It accounts for approximately 20 percent of global nitrogen fertilizer use<sup>2</sup>, and it is estimated that up to 66 percent of nitrogen fertilizer applied to rice may be lost via nitrous oxide emissions to the air. With approximately 80 percent of the world's rice production area, agriculture in Asia accounts for 88 percent of regional nitrous oxide emissions. The International Rice Research Institute estimates that global rice production results in 100 million metric tons of CO<sub>2</sub> equivalents per year. This is approximately the same level of annual GHG emissions as from 18.2 million average US automobiles.

China is currently the largest consumer of nitrogen fertilizer in the world, representing nearly 30 percent of total world consumption<sup>3</sup>. Irrigated rice in China accounts for approximately 30 percent of global rice production.

"The Ningxia Region of China has the highest rate of nitrogen use in rice and the highest rice yields in China," said Eric Rey, president and CEO of Arcadia. "Government officials and researchers in Ningxia have demonstrated very progressive thinking about how farm productivity can be maintained or increased while addressing concerns about environmental damage. The opportunity to maintain yield while reducing both production costs and GHG emissions is a clear example of

this type of thinking. The development of a method that allows farmers to participate in carbon credit markets will give agriculture a critical incentive to reduce GHG emissions. With adequate incentives, NUE technology could be applied to rice production globally, in which case it has the potential to be equal to taking several million cars off the road."

The agreement also calls for collaboration on the development of NUE and salt- tolerant rice varieties suitable for commercialization in Ningxia. The objective for salt-tolerant rice is to enable Ningxia farmers to reclaim salt-impacted fields for production and reduce total demand for limited fresh water resources.

Climate Change and Rice Cropping Systems: Potential adaptation and mitigation strategies. Report by the International Rice Research Institute (August 2006) FAO, 2004

**About Arcadia Biosciences, Inc.**

Based in Davis, Calif., with additional facilities in Seattle, Wash. and Phoenix, Ariz., Arcadia Biosciences is an agricultural biotechnology company focused on the development of agricultural products that improve the environment and enhance human health. For more information visit [www.arcadiabio.com](http://www.arcadiabio.com).