

AGRICULTURE ADVANCES

Through gene editing, Pairwise Plants is carving out a niche in the growing ag-tech economy.



Imagine having fresh local blueberries in North Carolina year-round.

That's the vision of Tom Adams, CEO of Pairwise, a Durham-based gene editing and plant-technology startup that focuses on engineering crops to extend their growing seasons and increase their availability.

"I love blueberries, and I dream of being able to get fresh, local blueberries every day," he says.

The company has brought together leaders in agriculture and technology to develop new varieties of crops through gene editing.

Founded in March 2018 by scientists David Liu, J. Keith Joung and Feng Zhang, Pairwise established its headquarters in a 36,000-square-foot building on the Golden Belt campus in Durham. Pairwise also occupies 24,000 square feet of greenhouse space and 30,000 square feet of manufacturing space in Research Triangle Park.

"North Carolina, Durham and RTP are a great fit for us, and there is plenty of space for growth," Adams says.

North Carolina is home to diverse agriculture with a variety of crops. It's also an emerging technology hub in the life sciences and pharmaceutical industries, says Haven Baker, chief business officer for the company.

"Establishing our headquarters in Durham gives us access to a stellar talent pool from the Research Triangle Park and the state's great university system," he says.

According to the North Carolina Biotechnology Center, Pairwise adds to a growing agriculture technology cluster in Research Triangle Park, positioning the region to become an important player in the emerging industry.

Pairwise employs 67, but Adams hopes to have 90 employees by this August. Adams estimates half the company's innovative plant scientists are from the area.

To do its work, Pairwise has licensed CRISPR, an enzyme capable of cutting strands of DNA, to make specific changes in crops that can't be done with breeding, according to Adams.

Pairwise, a Durham-based gene editing and plant-technology startup, is leading the way in agriculture technology by using advanced tools to alter the DNA of plants, creating crops that grow year-round in any climate and produce better food.

"It is an exciting process, like using a pair of tweezers or scissors to very specifically modify RNA or DNA," Baker says.

Pairwise also licensed a programmable base-editing technology pioneered by Liu that allows scientists to rewrite DNA.

Put simply, if CRISPR acts as scissors programmed to snip specific DNA sequences, then base editors are pencils with erasers, capable of directly changing one DNA letter into another.

"Using CRISPR and base editing, we now have the tools to engineer healthier foods and to make it easier for consumers to have access to a greater variety of healthy snacks," Adams says.

Genetic engineering can also create crops that will adapt to climate change or grow year-round.

"Fifty or 60 years ago, blueberries were exclusively a Florida crop," Adams says. "But thanks to breeding and technology, blueberries are migrating north. Today, South Carolina is the biggest producer of blueberries in the country."

Though the company has been in business for just a short time, scientists are already busy working in the lab and starting plants in the greenhouse. They have a goal to start launching products through their precision-breeding program in five years.

"We are not talking about technology alone, but we want to create products consumers can benefit from and purchase in their neighborhood grocery store," Adams says. ■

— Teri Saylor is a freelance writer from Raleigh.