"We put the gene of interest into the bacterium and mix it with the rice embryo," she explains. "The bacterium then moves the gene into the plant and we cultivate the cells with the new gene and, because plants have this amazing ability to create whole plants from a single cell, we can regenerate the 'transformed' cells into whole plants."

Just down the hall, Ronald enters the plant room, a space not much larger than a walk-in closet illuminated by full-spectrum bulbs that cast an otherworldly glow. The metal baker's racks are filled with tiny seedlings, grown from cells that have had their genes altered to produce various traits. She pulls out a tray to check the samples before proceeding to the plant genetics lab, a cavernous room bristling with beakers and test tubes, where researchers conduct intricate experiments to identify traits and transfer them into target plants.

Rice drowns if it is submerged for more than three days.

It was in a lab like this one that Reed biology professor Helen Stafford first explained to Ronald that plants communicate with one another through microbes. Ronald was fascinated—and hooked for life on exploring the inner world of plants.

Now a young Thai woman, a PhD candidate in plant genetics, calls Ronald over to discuss the direction of an experiment. They launch into a highly technical discussion of protocols and variables. Ronald gently prods, questions, and challenges the student's assumptions. This Socratic, back-and-forth inquiry is also something Ronald learned at Reed. While her friendly, collegial manner encourages staff to explore, it's obvious that she charts the course of research. Like an orchestra conductor, she directs the seemingly disparate paths of inquiry into a harmonious search for knowledge.

It was here in this lab that the gene for flood tolerance was first isolated—a discovery that has the potential to prevent crop failure in some of the poorest and most densely populated parts of the globe.

Sixty years ago, farmers in East India developed a variety of rice that could withstand flooding, but it produced poor yields and—worse—didn't taste good. Plant breeders tried to cross the flood-tolerant rice with better-tasting varieties, but weren't successful.

In 1996, David Mackill, head of the plant breeding division of the International Rice Research Institute, asked Ronald if her team could isolate the gene that conferred flood tolerance. It was the veritable needle in the haystack: one microscopic genetic thread intricately woven with tens of thousands of others. After eight years of painstaking work, Ronald's lab isolated a gene they called sub1. They placed sub1 into several rice varieties and tested them in controlled environments, submerging the tender shoots for progressively longer intervals.

Ronald can still remember visiting the muddy paddy where the plants had been fully submerged for two weeks—and survived. “I couldn’t believe it,” she says, smiling broadly. “It was as though the rice plants had been able to hold their breath until the water was gone. It was magic.”