



Climbing a Steep Learning Curve

By Lori Ward Bocher

Dr. Geunhwa Jung will be doing a lot of climbing in the next few years. As the new assistant professor for turfgrass pathology at the UW-Madison, he's on a steep learning curve. First, in a position that's 40 percent Extension, he'll have to hone his English speaking skills. Second, in a position that's 60 percent research, he'll be redirecting his area of study from common beans to turfgrass. And third, he just might want to learn to play golf when the time is right.

But with his academic track record and enthusiasm, learning new things shouldn't be much of a problem for Geunhwa (pronounced *goon-wa*). And he has a lot to teach us - not only about plant pathology and biotechnology, but also about a different culture.

Native of Korea...

Geunhwa was born in Taejon, South Korea in 1960. He's the son of a high school English teacher, but he didn't learn English at home from his father. "I learned it just like everyone else," he admits. "English is a required course in the middle school and high school and for the freshman year of college. But there's no learning conversation - listening and speaking. All I had to do was memorize grammar and test for the exams. That's why it's really hard to get an understanding of English. I had a really, really hard time when I first came to the U.S. I'm even having a hard time right now - writing, listening, speaking. Learning English and different cultures is one of my lifetime missions."

When it came time to choose a college and major, Geunhwa's choices were rather limited. "We go to the university based on a test score," he explains. "They don't care about how you did in three years of middle school and three years of high school. They only care about the points you got from the exam. Based on my score, the horticulture department is the only one I can go into."

"The second reason I liked horticulture is that there's not much pressure in that major so you can have time to prepare for governmental exams," he adds. "If you pass the government examination, you can become some high official."

After receiving a BS in horticulture from Chungnam National University in Taejon, Geunhwa knew that he wanted to further his education. "In Korea, there's a lot of pressure for higher education, mostly possible with good financial support from parents," he points out. "If you don't have a higher education, there's no way you can get a job. One way to get a higher edu-

cation that makes it easier to get a job is to get a degree from an overseas university."

Chooses the U.S...

Geunhwa chose to apply at universities in the United States. "Simply I like the United States," he says. "I don't know why. When I was in Korea and saw people from the United States, they were so tall. I was afraid of approaching them. But I simply liked the idea of coming here."

He applied at several universities. It was a letter from his soon-to-be major advisor, Dr. Dermot Coyne, that attracted him to the University of Nebraska at Lincoln. "He sent a very favorable letter. He wrote about all the details of his program. That is the reason I chose Nebraska," Geunhwa recalls.

Geunhwa came to the United States on January 2, 1989. After one semester, he returned to Korea to marry and bring his new wife to the U.S. His first impressions of this country? "Really good," he answers. "I say to myself, 'This is a place where I can do some research.' And all the

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"For my masters, I did interspecific hybridization in the common bean to transfer disease resistance from the tepary bean (*Phaseolus acutifolius*) to the common bean (*Phaseolus vulgaris*), which is more edible," he explains. "When you make crosses between two species, the tepary and common bean, the F1 hybrid embryo all the time aborts. We have to excise those embryos before they lose their viability, so they don't receive an inhibitory chemical from the parent plant to keep them from growing. We excise the embryo into an artificial agar media to grow it. Once you grow them you can plant them in the pot. And then you can make back crosses to improve the fertility of the hybrids and utilize them as a bridge (more compatible) to cross with either species. That was my major work."

First ties to UW...

After receiving his MS in December of 1991, he then proceeded directly to work on his PhD at Nebraska. But he made a change in his studies that led him to the UW. "My major advisor at Nebraska is a classical breeder, so he is always making crosses in the greenhouse and then putting the population out in the field for selection," Geunhwa explains.

"During the time I was finishing on my masters degree, there was a boom in biotechnology," he continues. "And I thought, maybe I can mingle with some of the biotechnology techniques for my PhD. That would be really good for my future. So I asked my advisor if there is any possibility that I can do some biotechnology work for my PhD. He suggested one of the professors at the UW-Madison and asked him to be a co-advisor to train me about some

of the biotechnology techniques."

That professor was Dr. James Nienhuis in the Department of Horticulture. Geunhwa came to the UW to do lab work for two one-month periods while still doing the majority of his PhD work at Nebraska. He studied the genetics of disease resistance in common bean species by using genetic linkage maps, QTL (Quantitative Trait Loci) mapping, and molecular markers.

After receiving his PhD in May of 1995, Geunhwa came to the UW to do post-doctorate research with Dr. Nienhuis. And four years later he applied for, and received, the assistant professor position in plant pathology.

Decides to stay...

When Geunhwa first came to the U.S. 11 years ago, it was never his intent to stay. "My goal was to finish up my PhD work and go back to Korea to get a professional job," he points out, adding that a life-changing event made him open to other possibilities. "Five years ago I didn't know anything about Christianity. My wife was going to church. For two reasons - God's grace and constant prayers from my beloved people, including my wife, Christian friends and pastors - God saved me and gave me a completely new life.

"Then my thinking changed," he continues. "I said, 'I open up the world to opportunities because I can do anything in Him.' So from that time on I thought, if God wants me to go back to Korea, I can go back. If He wants me to stay in the United States, I can stay. I just take it day by day, thinking that, if anything comes along, I would apply for it."

There was another reason he wanted to stay in the U.S. "If I have a job here, I can train people in more effective ways," he says. "If you go back to Korea, it's going to be really hard to bring in research grant money if you don't have a good political relationship with an effectual person and if you did not get an undergraduate degree from a prestigious university. Here in the U.S., if you work hard and are very diligent and very smart, I think you can show the people that you have the ability. But, back in my country, it's not easy. You have that same type of political and social influence here in the U.S., too. But not as much as in Korea."

Finds turfgrass fascinating...

When the position opened up in turfgrass pathology, Geunhwa applied for three reasons. "First of all, I wanted the job," he says. "Second, I didn't know much about turfgrass; in other words, it was a self-motivated challenge to learn new things. And, third, I was encourage by several professors I knew through my cooperative research.

"Let me explain more about my second reason," Geunhwa continues. "When I saw the job announcement, I thought, 'I need to take a look at turfgrass and what kind of work has been done on that crop.' So I go to the Noer



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Research Center and talk to Tom Schwab. He shows me several plots of what they're doing. I'm astonished! Some of the grass looks like carpet! This is not the grass that I'd been thinking about. When I saw the grass, it changed me completely and the preconception I had of grass. And I saw lots of opportunities in research areas for me to contribute with my expertise."

He applied for the job, got it, and will officially start probably in February. With a 40 percent Extension appointment, Geunhwa knows that the language barrier will be a challenge for him. "If I want to stay here, my goal for the rest of my life is to keep on working on my English. I can never forget that mission," he says.

For the Extension component of his job, his goal is, "To keep on updating and providing basic and applied research results for the plant pathology side of turfgrass through writings and presentations to the Wisconsin clientele - golf course superintendents, home owners, and sod growers. I want to make it easier for them to manage their jobs," he says.

"Another important responsibility is to coordinate with Jeff Gregos and Gary Gaard who are currently in charge of diagnosing commercial and homeowner samples for the Turf Disease Diagnostic Lab," he adds. "And I'm anxious to get to know the people in the turf industry." He was looking forward to his formal introduction to the turf industry on January 11 at the Turf Expo.

Studying molecular markers...

For the 60 percent research component of his job, he wants to zero in on the use of molecular markers to help understand the population structure and dynamics of important turfgrass pathogens, such as snow mold, for better disease management. He also wants to study the genetic components of disease resistance to turfgrass pathogens.

"Molecular markers, compared to morphological markers (phenotypic traits), are excellent tools because of easiness, accuracy, and unlimited numbers," Geunhwa explains. "The two most practical applications for using PCR (Polymerase Chain Reactions) makers is: one, to diagnose diseases which are symptomatically difficult to identify; and, two, to fingerprint new clones or cultivars."

He has already visited with Dr. Mike Cassler about his research to find bentgrass that is resistant to snow mold. "We've already talked about some research projects we could work on together," Geunhwa points out. "I'm so glad that he collected so many bentgrass clones (from the northern and southern parts of Wisconsin) that have inherited snow mold resistance. Using molecular marker techniques, those materials, or segregated populations derived from the cross of snow mold resistant and susceptible clones, can be utilized by me to understand the biology and genetics of disease resistance and host-parasite interactions.

"In more detail," he continues, "F1 progenies from the

cross will be challenged by virulent snow mold strains in both the greenhouse and in field replicated trials. Then I'll look for a statistically significant association between marker genotype and the disease symptoms. Molecular markers will be detected showing strong linkage with disease resistant genes. Eventually, that marker information will facilitate in the process of breeding for disease resistant turfgrass which can be adapted in Wisconsin."

U.S. resident, not citizen...

After 11 years in the U.S., Geunhwa is still a Korean citizen. "But officially and legally I'm a permanent resident of the U.S.," he adds. At this point, he does not plan to apply for U.S. citizenship. He has returned to Korea for three visits in 10 years, and his parents have come to the U.S. for several visits. "We usually see each other once a year," he points out.

Geunhwa and his wife, Eunjee Ahn, have two children: Roy, who is 9 years old; and Emily, who is 3 years old. The children are dual citizens of the U.S. and South Korea. The Jungs live in Madison where they are active in their church. In their free time, they like to bike and fish together.

And maybe when his professional and language learning curves aren't as steep, Geunhwa will have some time to learn how to enjoy that carpet-like turfgrass from a golfer's perspective. ♣



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