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Aloha,

Sylvia Yuen
Interim Dean and Director of CTAHR

www.ctahr.hawaii.edu
SECOND QUARTER

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Bacteria Online

Would you grow a papala? A pipicha? A bitter ball? Maybe not, but you might be able to find one in your local farmers market, thanks to a growing population of immigrant farmers bringing the techniques and products of their native lands to Hawai‘i. But while there's much that these growers know, there are aspects of starting to farm in a different country, climate, and economy that can be confusing and even daunting.

This is where LIFE comes in. The Local Immigrant Farmer Education Program serves Southeast Asian farmers in Hawai‘i whose small acreage, remote locations, and limited English language skills may make it difficult for them to connect with local growers. LIFE also serves other socially disadvantaged, limited-resource producers, including women and Native Hawaiians. The program is headed by Extension agents Jari Segui, she and Randall Hamasaki, Maria Diaz-lyke, Robin Shumabuki, and Glenn Sako are the training members of the group. Recently retired agent Steve Fukada helped to make the program what it is today; project founder Sabina Swift stays involved, as does Stuart Nakamoto, and in 2010 Ming Yi-Chou and Elsie Burbano joined the team.

The hands-on aspect of the program is one that farmers appreciate the most. Trainers and growers get out into the fields and prune, spray, and build. At a recent “field day” event, participants were able to take part in building aquaculture grow tanks, while other workshops have shown how to deal with small business taxes, ways to combat insecticide resistance, and the proper care and handling of papayas for shipping to the Mainland. Many of the program’s materials and workshops are translated into the languages of their intended readers, something that has been lacking in previous training programs.

At LIFE’s core is the one-on-one interaction provided by the “Farm Doctor” visits, where an agent meets with individual farmers on their land to “diagnose” any problems with the crops or soil. It’s the interaction, the mutual teaching and learning, that’s important. Clients can participate in the program by conducting “Cooperator-Inspired Field Trials” to investigate planting or agribusiness techniques and share their findings with LIFE, while program coordinators act as resources and aid in collecting and summarizing the data. And one of the program’s stated measures of its own success is the number of participants who are able to start helping others in their community. What better way to reap the bounty of what different cultural crops can bring to the table? Hawaii AgDiscovery Program 2011

Established 10 years ago by USDA’s Animal and Plant Health Inspection Service (APHIS), AgDiscovery has grown into a nationwide program, held this year at 13 campuses throughout the nation. In June and July 2011, the University of Hawai‘i, represented by CTAHR, participated in the program for the first time. Ten exceptional students were selected from over 70 applicants to take part in a transformative experience, blending technical learning and cultural immersion. The overall goal of the Hawaii AgDiscovery Program was to expose high school students to cutting-edge technologies and stimulating learning experiences that would encourage them to select an agricultural field as an academic major and as their future career choice.

The program was planned by a team of CTAHR faculty and staff, along with professionals from APHIS’s Plant Protection and Quarantine, Veterinary Services, Biotechnology Regulatory Services, and Wildlife Services branches. The intensive two-week training program included numerous hands-on classroom exercises and lectures delivered by experts from CTAHR and APHIS, as well as visits to CTAHR laboratories and experiment stations, APHIS and other government facilities, and commercial agricultural operations. In the classroom and field training, students learned to perform water-quality analysis, use GPS devices, identify microorganisms under the microscope, extract DNA, and color fabric using natural dyes. In addition to learning by doing, students got to network with professionals across the agricultural spectrum and observe careers in agriculture and natural resources management. Besides the many APHIS branches, and other government institutions such as the Hawaii Department of Agriculture and the Honolulu Zoo, a number of private companies contributed to making the Hawaii AgDiscovery Program a success, including Kualoa Ranch, Mari’s Garden, Monsanto, and Pioneer. The CTAHR Alumni Association also added their support.

The training program also included sessions to hone teamwork, leadership, and communication. Throughout, students were exposed to local culture, Native Hawaiian practices, and college life. In their exit surveys, without exception the student participants agreed they had had “fun,” “educational,” “engaging,” “exciting,” “amazing,” and “memorable” experiences that would help them make future decisions about their field of study in college and the many career paths in agriculture and natural resource management.
**Bacteria Online**

**The Staff of LIFE**

Could you grow a papao? A pipicha? A bitter ball? Maybe not, but you might be able to find one in your local farmers market, thanks to a growing number of consumers interested in trying new fruits and vegetables. The Hawaii AgDiscovery Program is one of those programs that are helping to bring new foods to the market. The program is run by the University of Hawaii, College of Tropical Agriculture and Human Resources (CTAHR), and it is working to identify and add new strains of plants to the local market. The program is focused on identifying new plants that are not only more profitable, but also better adapted to the local climate. The program has already identified over 800 new strains, and it is predicted that the number of participants who are able to start helping others in their community.

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ing-dong! Please sign here for your package of plant pathogens. With all the ag inspection protocols at the airport, it’s surprising to think of deliberately sending pathogenic material in and out of Hawai‘i. But researchers wanting to identify unknown strains of bacterial plant pathogens have had to do just that—until now.

Plant-associated bacterial pathogens cause billions of dollars in crop losses annually, so rapid and accurate identification is essential for agriculture. For example, the genus Xanthomonas contains many important plant pathogenic species, which altogether infect over 392 plant hosts. Quick identification of closely related strains helps agricultural workers make informed decisions about control methods, including quarantine and destroying infected plant material.

Using computational analysis to compare six anonymous genomes of Xanthomonas, Kevin Schneider, a graduate student in Geront Preston’s (SMBE) lab, discovered a DNA marker that distinguishes closely related strains of Xanthomonas as well or better than the widely used marker based on the ribosomal intergenic spacer region (ITS). This new marker, named Rif, can distinguish plant-associated bacteria below the species level and is also inherited more faithfully than the ITS marker. Kevin went on to genotype about 800 strains of phytopathogenic bacteria from Anne Alvarez’s (PEPS) collection, and the database should be transferrable to most other bacterial genera in the future.

The other good news: The team created an online database—http://genomics.hawaii.edu/cgi-bin/RIFdb/html.pl—which allows comparison of specimens from all over the world without having to ship the organism into or out of Hawai‘i. This is important, both because accidental shipping of infected plant material has already led to global distribution of certain strains, and because the risk inherent in maintaining and shipping live pathogens into and out of our state makes side-by-side strain comparisons increasingly impractical.

The database will continue expanding the more other scientists use it to identify and add other strains, or cross-reference it with other collections, which in turn will help with the classification of even more unknowns. And we can go on to shipping less potentially dangerous items, like snacks from Hawaii AgDiscovery Program 2011

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LIFE project founder Sabina Swift (right) talks with a coffee farmer on the Big Island.

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