Ho`oulu i ka `āina a me ka mahi`ai

By: Aleysia Kaha

The Agriculture Club stands strong with its mission to “ho`oulu i ka `āina a me ka mahi`ai,” to grow the land and its farmers. Last Saturday February 16th, the club created a kalo garden for the Hilo Union Elementary School. There are 2 varieties of kalo (Pololu, Maoli Lehua) donated by Aleysia Kaha for the school’s starting garden. Other native Hawaiian varieties are being donated by Nancy Redfeather, director and founder of Hawai`i Island School Garden Network, who brought the kalo huli (cuttings) from Amy Greenwells. This project, under direction of Aleysia Kaha, is made as the beginning of connecting our College of Agriculture Students with the local schools and our communities keiki (kids). Under the USDA, Alaska Native/Native Hawaiian serving institutions, Educational Grant, this project was fully funded and supported by Dr. Sakai. It is the seed to future school garden projects set forth by the Agriculture Club. The principal, Pattie Andrade-Spencer, has been very supportive of this endeavor and is looking forward to a place where the kids can build the fundamentals of gardening.

If anyone is interested in helping the Agriculture Club’s project to build this māla kalo and other future projects please contact Aleysia Kaha as soon as possible. Email: aleysia@hawaii.edu

Dr. Rodney C. Jubilado heads Filipino Studies at UHH that integrates Sustainable Agriculture

The University of Hawaii at Hilo launched a Filipino Certificate Studies program starting Fall 2012. With its launching, Dr. Rodney C. Jubilado, was hired on August 1, 2012 as an Assistant Professor of Filipino Studies to head the program. Prior to accepting his position with UHH, Dr Jubilado was a professor of linguistics, teaching in both undergraduate and graduate programs, at University of Malaya, Kuala Lumpur, Malaysia where he also obtained MA and PhD degrees in theoretical linguistics.

“See Jubilado, page 6”
Coconut Rhinoceros Beetle Poses Threat to Hawaii

By: Kristin Hardy

The Coconut Rhinoceros Beetle (CRB) is native to tropical Asia. Within the last century it has made its way into many of the Pacific Islands, moving closer and closer to the islands of Hawaii. It is assumed that all cargo, whether it arrives by boat or air, is thoroughly checked but, after the recent introduction of invasive pests such as the coqui frog and the fire ant, who’s to say the CRB won’t be next?

Guam has already felt the presence of the invasive CRB. It was discovered there in 2007. Just four years later the island was losing the battle, wrote Clynt Ridgell for Pacific Island News. “So far nothing is working on the eradication of the coconut rhinoceros beetle and, in fact, it is continuing to spread around the island and has even made it inland to the central jungles of Guam.” The negative impact the CRB has had in Guam in just four years proves the potential threat it poses to Hawaii.

CRB mainly targets coconut and oil palms but is known to strike other palm species, as well. It burrows into the growing point of the palm and either destroys it directly or causes it to die through rot or disease. If CRB is present, the palm fronds will show V-shaped cuts. These cuts are a result of the pest’s burrowing when the frond is in the early stages of development.

Adult CRB feed on palms during the night and during the day can usually be found in their breeding sites along with their feeding larvae. The larvae do not attack palms but instead feed on the decomposition of other organic material. “Eggs are laid and larvae develop in decaying logs or stumps, piles of decomposing vegetation or sawdust, or other organic matter,” writes Mark Schmaedick, entomologist for American Samoa Community College. To prevent the reproduction of CRB, it is important to clear away dead or dying vegetation and dispose of it properly.

If the CRB poses such a large threat to the beautiful palms of Hawaii, what is being done to ensure that this invasive insect is not introduced here? According to Cheryl Young, State Survey Coordinator for Hawaii and CAPS (Cooperative Agriculture Pest Survey) program, a proposal has been written to conduct a survey to run from September 2012 - August 2013, but funding for the survey has been held up due to delays in Congress. The CAPS program is funded by the USDA (United States Department of Agriculture) and, according to their website, “the CAPS program conducts science-based national and state surveys targeted at specific exotic plant pests, diseases, and weeds identified as threats to U.S. agriculture and/or the environment.”

If early detection is our greatest defense then becoming aware of the signs and symptoms is key. If you notice palms in your area looking sickly or dying, v-shaped cuts in fronds or large holes bored into the base of fronds call (808) 643-PEST.
Despite billions of dollars of research and advertising in support of furthering the industrial agricultural system there have been increasing position statements during the past few decades from both within and outside the agricultural sector that “business as usual is not an option for the future”. Unfortunately this gradual paradigm shift has often resulted in the blanket characterization of classical agricultural production science disciplines (agronomy, animal science, and horticulture) as being blind followers of a vanquish-the-enemy (problems – real, potential, or imagined) approach based largely upon synthetic chemicals and modern precision mechanical devices. Some ecologists and conservation biologists even seem to suggest that a variant of the emerging discipline of agroecology based upon the modern science of ecology will eventually replace the classical agricultural production science disciplines. It is surprising that so many of these scientists and their followers in other disciplines seem to suggest that what is needed for agricultural sustainability is simply widespread skill and knowledge transfer of the labor-intensive traditional farming systems, crop rotations, and agroforestry practices of indigenous cultures to other areas with similar climates and soils. These claims are usually made without experimental verification through the standard replicated field trials of classical agricultural production science.

Numerous agrotechnology transfer studies conducted during the past 50+ years have shown that transfer of agricultural practices without prior on site verification can be extremely risky for farmers and their communities. While there is no doubt that information useful to modern agriculture can be gleaned from traditional farming systems, the production required to feed a population of 9 billion in 2050 cannot be constructed simply by switching to these systems. The success of traditional subsistence systems lay in their relatively non-extractive use of natural and human capital. Under intensification and resource extraction the systems collapse. Because they do not permit intensification and superior integrated nutrient and pest management approaches that optimize both production and economic returns, it is only under the unrealistic scenarios of reduced population pressure and reversion to an agricultural society that these systems can be made to work.

The College of Agriculture, Forestry, and Natural Resource Management takes pride in being a “hands on” program which puts theory into practice to provide students with the background needed to successfully contribute to sustainable agriculture. We are striving to improve the scale and modern technical relevance of this production experience. In the next issue I will address food sovereignty in Hawaii and the contribution that our College can make in part through its emerging general engineering program with tracks in alternative energy, food engineering and safety, and instrumentation.
Hatching knowledge and experience at the University of Hawai‘i at Hilo’s aquatic research center

By: Chelsea Morrison

As an Aquaculture major at the University of Hawai‘i, I have found there are not many opportunities for people interested in this field to get hands on experience, but then I discovered PACRC. PACRC stands for Pacific Aquaculture Coastal Research Center. There is great intensity to our work, mentally and physically. Everyone at my job has to be in great shape to handle the physical tasks of cleaning and maintaining the hatchery.

I started working there in June, 2012 and I love it. It is located in Keaukaha, just-off the main road and next to the break wall, in Hilo Bay. PACRC is operated and run by university students who work there. It is the first aquaculture facility on the Big Island to ship their product out of the state, in the last fifteen years.

Kevin Hopkins, director of the University of Hawai‘i at Hilo’s Aquaculture Center explained that PACRC is a multi-disciplinary coastal research center that is open to both students and faculty who want to research. For example, some UHH grad students are conducting research on how to grow the local macro algaes, Limu kohu.

The center also conducts activities with local schools. For example, PACRC hosts an annual celebration every Ocean Day on February 20th and the general public is invited. I work in the hatchery at PACRC, which is where all of the “magic” happens. The hatchery is where spawning, hatching, setting and rearing of oysters and other bivalves take place.

It is magic because students literally breed and raise oysters. One type of oyster being spawned here is the Pacific Cup Oyster. Where does this student-run facility send millions of “baby” oysters? According to Hopkins, PACRC regularly makes shipments to the West Coast and other parts of the world. Last year they shipped about 800,000,000 oysters worldwide.

The West Coast Fisheries

West Coast demand for spat (baby oysters), has been growing in recent years. That’s because the ocean waters there have become more acidic. Hopkins explains, “Higher levels of carbonic acid in the water lead to shell deprivation in young oysters.” Scientists believe this is due to global warming.

According to a survey done in 2007 by an international team of scientists, “Water that upwells seasonally along the West Coast of North America is growing increasingly acidic.” This alarms oyster farmers on the West Coast because they have higher mortality rates due to the acidic waters. This increasing threat has driven the companies to seek their culture from elsewhere. PACRC spawns oysters and produces larvae, and in a nutshell, when they are the correct size they are shipped to these companies, who are in dire need.

“PACRC is a facility that operates 7 days a week, 365 days of the year and even on holidays,” says Hopkins. Unlike hatcheries on the mainland which do not produce during their cold season, PACRC can produce culture year-round. There is, however, a decline in production at PACRC.

This decline in the local facilities’ production occurs in October and November, because it is too cold in the mainland to culture oysters in the wild. PACRC’s production slows but it doesn’t stop completely. This is actually a time when the facility can be cleaned and all of the systems can be cleaned and sterilized.

See “Hatching Knowledge,” Page 6
Kūlia Kauhi Tolentino

"[Our ancestors] didn’t create their lo‘i system for their generation alone…they created it so it would last for many generations to come. -Kūlia Kauhi Tolentino

As director of Pōhāhā I Ka Lani, Kūlia Kauhi Tolentino is continuing the Hawaiian tradition of passing on knowledge through preservation of the cultural and natural resources at Nāpo‘opo‘o, in Waipi‘o Valley. Aloha for the land, as well as aloha for others, inspired Kūlia Kauhi Tolentino to create Pōhāhā I Ka Lani; a non-profit organization striving to restore the historically significant lo‘i at Nāpo‘opo‘o.

Established by Kūlia and her father, Pōhāhā I Ka Lani’s mission is to not only sustainably cultivate the land, but also to provide a welcoming environment for people to get intimately involved in Hawaiian culture. The program’s name conveys its purpose. The phrase pōhāhā i ka lani describes the action of lighting and thunder rolling forward to take care of the land as well as the people. This is a traditional belief that can be confirmed scientifically. Nitrogen in earth’s atmosphere is not available to plants. During storms, when lightning strikes, nitrogen is ‘fixed,’ and combines with water to create ammonia and nitrates; which fall to the ground with precipitation and are subsequently assimilated by plants. By naturally providing nutrients to plants, lightning indirectly provides sustenance for people. Also, the fact that the sun continues to rise is considered pōhāhā i ka lani. As the sun is sure to rise, Kūlia’s program will continually cultivate Nāpo‘opo‘o.

As a child, growing up in Honoka‘a, Kūlia would frequent Waipi‘o Valley with her family to gather food from the land and fish in the ocean and river. It was during these trips that Kūlia’s father and grandfather made a lasting impression on her with their eagerness to help others without expectation and reverence in stewardship of the land. “If you are going to take (or harvest), you are going to have to give back (or cultivate),” says Tolentino. This reciprocal commitment can be applied to all types of relationships.

After graduating from the University of Hawai‘i at Hilo with a BA in Hawaiian Studies and Anthropology in 2001, Kūlia began teaching at Ke Ana La‘ahana Public Charter School. "I wanted to offer my students more," expresses Kūlia. So she began scheduling weekend camping excursions to Waipi‘o Valley. Kūlia and her students explored the valley, working occasionally on different farms. The students would hike the valley’s trails, learning Waipi‘o’s history, as well as its original Hawaiian place names.

Kūlia’s program began to expand with help from her father—who would transport bags for large groups. She began hosting outside schools and colleges. Groups were sometimes as big as two hundred. “As I look back, I don’t know how I did it!” exclaims Kūlia in astonishment.

Kūlia began to focus the trips on restoring Nāpo‘opo‘o. Located just below Hi‘ilawe Falls, the highest waterfall on the Big Island, this area of Waipi‘o is special. Ka‘ao, located opposite of Nāpo‘opo‘o is the first area to receive sunlight. ‘Ao is the first shoot or leaf particularly when dealing with kalo. Nāpo‘opo‘o, can also be called Napō because it is the first area in Waipi‘o to become dark. It is said that this area was where the nā po‘o, chiefs or ali‘i, would frequently gather. Waipi‘o was, during a period of Hawai‘i’s history, where the seat of government was; this is why the valley is also called “the Valley of the Kings”.

Nāpo‘opo‘o is one of the last places in Waipi‘o that still has lo‘i lined with pōhaku. These ku‘auna are estimated to have been built between 800 A.D. to 1200 A.D. There are also forty three house sites -most of which are overgrown with both native and invasive species like coffee, African tulip, and kukui nut trees.

During the Agriculture Club of UH Hilo’s recent trip, two lo‘i were cleared and planted. Nāpo‘opo‘o’s terrain and remote location make it almost impossible for heavy machinery to be used; so nearly all of the work is done by hand. In 2007, Kūlia obtained the lease to Nāpo‘opo‘o from the Bishop Museum. This has created a stable foundation for Pōhāhā I Ka Lani’s vision of restoration and its subsequent ability to provide sustenance. Over the years, Pōhāhā I Ka Lani has welcomed groups from all over the state of Hawai‘i, the mainland, and even from other countries.

With well over 500 helpful people volunteering in 2012, the work is hardly done. One of Kūlia’s goals for Pōhāhā I Ka Lani is to restore the entire lo‘i system of Nāpo‘opo‘o, so that the land is sustainably productive. Volunteers are the reason Pōhāhā I Ka Lani is able to grow and move forward, participants get the privilege of working in one of the oldest and most significant lo‘i systems on Hawaii island. Groups or individuals interested in lending a hand and receiving the gift of knowledge and experience are encouraged to contact Kūlia Tolentino at kauhikoa21@aol.com.
Some of PACRC’s History

PACRC was established a few years ago at the site of Hilo’s former waste management facility. Hopkins explains that the construction should be finished in about a year. “Right now the establishment is expanding. The construction will help the farm immensely and allow production to increase.” Additions will include a nutrition lab and a fish processing/food safety lab.

Visitors are welcome, so tour the University’s Pacific Aquaculture Coastal Research Center (PACRC). If you are a student at the UH and are interested in Aquaculture, please come and inquire about volunteer opportunities…who knows, it may lead you to a job.

Hatching Knowledge Cont.

Faculty Highlight Corner

Dr. Rodney C. Jubilado cont.

A prolific writer and researcher, he has shared his articles in numerous venues such as international conferences in various countries in Asia, Australia, and America. He is well published in international journals, edited academic journals, books, and manuscripts supervised MA and PhD students and a member of professional organizations of his field and allied disciplines. He teaches GE-approved course, Elementary Filipino I (Fil 101) in Fall semesters and Filipino Films (FIL330). In Spring sessions, Dr. Jubilado teaches Elementary Filipino II (Fil 102) and Filipino Culture (Fil 398).

The Filipino Studies Certificate at UHH is perhaps the only program in the US that integrates Sustainable Agriculture (AG 230) in its curriculum. Dr. Jubilado stresses that to learn about the Philippines, one has to learn about its agriculture which is a huge part of the Filipino culture. “The focus here is the Philippines, which is an agricultural country” says Dr. Jubilado whose family in the Philippines owns a farm that grows coffee, coconut and cacao. The program provides a better understanding of the Filipino American community while allowing Filipino American students the opportunity to explore their heritage and non-Filipino American students an opportunity to learn about the Philippines. The multidisciplinary program comprising of a liberal arts foundation and cultural and natural resources-based studies will be offered in three tracks: 1) cultural-based; 2) natural resource-based and 3) cultural and natural resource-based combination.

The program will provide platforms for undergraduate research opportunities, community outreach activities and an optional international student exchange between UH Hilo and participating Philippine Universities. This knowledge is essential for those seeking advanced degrees and careers including agriculture, environmental studies, medical fields, services, tourism, politics and global trade and business. To learn more about the program please contact Dr. Jubilado (rodneycj@hawaii.edu).
Who Do You Think You Are?: The Academic Journey and Personal Integrity

By Elizabeth Capron

A College education is a personal journey that can be a difficult process. Some students are lucky to know exactly what field or career they want to get into as soon as they enter college; others simply go through their general education requirements, seeking what feels right for them. Semesters come and go, opportunities present themselves, and the cycle continues. Once the degree(s) is accomplished, what then? College is a huge investment of not only money but also time, the goal ultimately being future success- aka “happiness”. So why not invest in something that not only pays, but that you’ll actually enjoy doing (a vital ingredient in the whole happiness idea)? Agriculture contains a vast array of paths that lead to all sorts of different areas of study. With so much information and choices, how can it be narrowed down to what you want to do?

With all of these questions in mind, I headed to the most obvious resource: the Career Center. From there I was directed to the Advising Center and was given an appointment with Lyssa Sakamoto, a Student Success Advisor.

I explained to Lyssa my questions, and she was very obliging. She showed me a couple online career resources such as

- O*Net Career Counseling Website (http://www.onetonline.org/)
- Career Kokua¹ (http://www.careerkokua.org/)

These websites contain information on thousands of job titles in all kinds of area of study.

Lyssa further directed me to the career center’s library of career books, available for reference to all students and introduced a couple of tests to better understand myself from a professional perspective.

The first test I participated in is called “the Meyers Briggs Type Indicator (MBTI)”. The psychology behind which comes from the works of Carl Jung, the famous Swiss psychiatrist/psychotherapist and contemporary of Sigmund Freud. Based on the answers given in the test the participant is given a “type” which generalizes your innate tendencies, or areas of your personality that are true to your nature and carried throughout your lifetime.

After I took the test, my “type” was determined. My expectations were low (I have taken personality tests before, and such generalizations have not proven true to my character) but I was surprised to find the description of my type to be more or less credible. I was then given a handout summary of my type’s strengths, weaknesses, potential areas for growth, social tendencies and a list of popular careers for that type. The most interesting information for me was the weaknesses or “shortcomings” and how to improve upon them. There I found behaviors in myself that I was not conscious of before, but then after reading it became very apparent that I possessed. The advice given on how to deal with such “vices” became invaluable, and may prevent frustrations for me in the future.

The second test is called the “Self-Directed Search (SDS)”, developed by sociologist/psychologist John L. Holland. This test seemed similar to the previous, but also focuses on working styles, values, and working environments. Questions are answered in a simple yes/no format in competencies/skills, and careers of preference. The scores are tallied and then translated into a three-lettered “Holland Code” from six options: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional along with suggested career/major choices. This test is quite complementary with the first test, and I would recommend taking both to those who are interested in career planning.

After my appointment was over, I left the Advising Center feeling confident in my choices for my future. The information I learned from the tests and my discussions with Lyssa increased my personal understanding substantially.

In conclusion, it pays off to get a better understanding of yourself when determining future goals and career investments. Not only would it increase your chances for better decision making, but would also prove to be essential in moving through the constantly changing ebb and flow of life. It is in this ability to move through life, and to stay true to personal integrity where true happiness and contentment lie. And if we could get paid to do what we do best, all the better!
Grow Mushrooms
By: Matthew Roderick

Mushroom cultivation at home may be simpler than you think. As a hobby, for profit, or as a viable means for developing food security, growing mushrooms has become an increasingly popular practice for those who enjoy the healthy and flavorful benefits of mushrooms. These would be edible varieties such as shiitake, portobello, oyster, lions mane, and pioppino to name just a few. Mushrooms have been renowned for thousands of years for their therapeutic effects, medicinal nature, and highly nutritious quality. In addition to containing a good source of protein, many mushrooms, especially gourmet varieties, are shown to have antiviral, anticancer, antibiotic, and anti-inflammatory properties, as well as immune strengthening and cardio protective compounds.

Mushrooms are the surface level fruiting bodies of a massive, subterranean network which is the collective and living body of the single organism, sort of how a fruit is to a tree. Fungiculture, as some would like to call it, utilizes the natural process of decomposition, the recycling of organic wastes, as a means for producing food, medicine and other products for human use. Fungi will efficiently utilize the last bits of stored energy within these wastes; they are heterotrophic, like animals, absorbing nutrients from the food that they depend on to find in their environment.

In my experience with growing mushrooms, the easiest way to start off is to buy a syringe of suspended culture solution from one of the many mycology supply shops online, anywhere from $15-$30 per syringe. The nice thing is that a single syringe can inoculate dozens of substrates, with each individual substrate producing up to 5-6 harvests; and you can then simply continue to culture off those harvests to spawn more generations in an almost endless cycle starting with that original syringe. Outdoor methods most often involve spawning the culture on grains within quart sized mason jars which you then open up and inoculate a secondary substrate for the growth of the edible fruiting bodies, such as hard wood logs, woodchips, stumps from fell trees, laundry baskets of compacted straw or even shredded paper in plastic bags with holes cut in it for the mushrooms to poke out through. Indoor methods can use the same grain spawn to inoculate foil food trays filled with composted horse manure.

My favorite indoor method so far is the Brown Rice Flour technique (BRF tek). Brown rice flour and vermiculite are mixed with water and the mixture loaded into half-pint, wide mouth jars. Four small holes are punched into the lids for inoculation later on. The jars with the substrate are placed into a cooking pot with enough water to boil and produce steam. The jars are steamed for 90 minutes, allowed to completely cool and are then inoculated through the four small holes via syringe. They are stored in a cool, dimly lit area for 2-3 weeks until the white mycelium completely covers all visible surfaces of the substrate. You then pop the cakes out of jar (they resemble white birthday cakes at this point), and place them in a terrarium made of a plastic Sterilite container with a lot of holes drilled in it for ventilation. The terrarium is lined at the bottom with a 5 - 6 inch layer of perlite for humidity control and the whole thing is sprayed or misted once every other day. Mushrooms will pin 1-2 weeks later, and after 3 weeks you will have a nice harvest, with 2-4 subsequent harvests later on. BRF tek is by far the fastest method I've tried with the whole process taking 2-3 months. Depending on the method that you choose, you can have harvestable mushrooms anywhere from 2 to 12 months. One very important thing to keep in mind when starting off is to make sure that you sterilize your primary substrate, such as the grains in the jar before you inoculate them with the culture. If you are interested in growing mushrooms, please consult the many resources available online or in book form. Listed are some good resources for research, supplies, and video instructions; all of which are true and tested. I encourage you to check them out.

- namyco.org/cultivation/grow_at_home.html - North American Mycological Association
- Mushrooms: Cultivation, Nutritional Value, Medicinal Effect, and Environmental Impact Available online at Google Books (166 pages viewable)
- Lil' Shop of Spores - www.lilshopofspores.com