Inside this issue:

<table>
<thead>
<tr>
<th>Crop of the Month</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture Club Updates</td>
<td>3</td>
</tr>
<tr>
<td>Student Highlight</td>
<td>4</td>
</tr>
<tr>
<td>Student Volunteers</td>
<td>7</td>
</tr>
<tr>
<td>Pest of the Month</td>
<td>8</td>
</tr>
</tbody>
</table>

Publisher/Editor: Norman Arancon

Layout Editor: Sara McCaffery

Contributors:
Aleysia-Rae Kaha
Elizabeth Capron
Bruce Mathews
Michael Pierron
Kristin Hardy
Chelsea Morrison
Noel Dickinson
Matthew Roderick
Stephanie Anderson
Collin Saxby
Sarah Chard
Michael Sthreshley
Noel Dickinson
Leināala Hall
Malaika Ross

Bringing it Back to the Farm, Pamantasan Style

By: Noel Dickinson

As the venue for this year’s University of Hawai‘i System Pamantasan Conference, UH Hilo hosted Filipino students and faculty from UH campuses statewide. “Back to the farm! Our roots in sustainable practice” was the basis for a day full of activities such as workshops, campus tours, and even a fashion show. With the price of fuel steadily increasing and climate change becoming more evident, sustainability is transitioning from a trendy idea to a vital necessity - particularly here in Hawai‘i. College students, especially UH Hilo’s College of Ag students, have been increasingly concerned with addressing issues like waste management and imported food and fuel dependence in Hawai‘i. The Pamantasan Conference was designed to be a catalyst for thought, dialogue, and innovation concerning the ever evolving paradigm that is sustainability.

Chancellor Donald Straney welcomes participants of Pamantasan Conference

The Conference was the perfect time for the knowledgeable students of Dr. Norman Arancon’s Sustainable Agriculture course (AG 230) to showcase their hard work. Agricultural student guides, Brandon Carvalho, Christopher Long, Katherine Sennet, and Jonathan Shestokes, conducted tours of the CAFNRM. Participants in the Pamantasan were given interactive demonstrations of permaculture, diversified home gardening, vermicomposting, and composting at four different sites on UH Hilo’s campus.

Continued on page 5
Crop of the Month: Oil Palm: Demystified

By: Lukas Kambic

Most ag students have heard of oil palm. We've heard of it in passing as a cause of massive deforestation in Southeast Asia. Or we've heard about the possible heart-attack-inducing effect of palm oil. Or we've heard it's the energy crop that will end our dependence on petroleum. What's this evil plant that makes people clear rainforest faster than before to make space for it? It's a big spiny palm tree (Elaeis guineensis), and it makes a lot of oil. The trees bear bunches of small orange and black fruit with hard-shelled kernels inside. The fleshy fruits are oily like avocados, and the coconut-like kernel contains another type of oil.

If you live in central Africa, the home of the palm, it's part of everyday life, an essential food source. Fruit bunches from semi-cultivated trees are gathered, boiled, and the pulp is pounded by hand to separate the oil. The unrefined fruit oil is bright red thanks to carotenoid pigments like lycopene, the stuff in tomatoes. It's typically semi-solid at room temperature and has a nutty flavor. Good for salad, light frying, stews, you name it. You can find bottles of it in ethnic grocery stores on the mainland, but the unrefined stuff is mysteriously rare in the western world. Most palm oil you'll eat here is highly refined and mixed with all kinds of junk in processed foods and shortening.

That's part of the reason it's so tricky to determine the health effects of palm fruit oil. The kernel oil, which makes up about 10% of the yield, is very similar to coconut oil (which also comes from a palm kernel), and there's no good evidence that it harms cardiovascular health in humans [Author's note: in the past 2 years I've eaten at least 10 pounds of palm kernel oil, and over 20 pounds of coconut oil]. The fruit oil is more suspect. It contains oleic acid, the healthy fat found in olive oil, but also a good portion of palmitic acid, one of the few non-synthetic fatty acids that does show some correlation with heart disease. No one knows for sure. Low-palmitic palm varieties exist but have lower yields. Future breeding work can improve things.

Palm oil is the world's most popular vegetable fat, ahead of soybean and olive oils in production and a large part of diets in Africa and South Asia. Over 50 million metric tons were produced in the 2009-10 growing year. Modern hybrids have the highest yield per acre of any commercial oil crop, and generate more calories per acre than any crop of any kind, which can be a good thing. The oil makes good biofuel too, but the increase in production in recent years has been driven by food demand.

Indonesia and Malaysia are the biggest producers. Farmers there have come under criticism for wrecking biodiverse forests and replacing them with palm monocultures, which often don't anchor the soil well and require lots of fertilization.

Continued on page 6
Agriculture Club Updates

By: Aleysia Kaba

Pana`ewa Community Garden April 20th 9am-2pm
Orlo Steele, the Forest TEAM program Director at the Hawaii at Hilo Community College, invited the Agriculture Club to work with the community of Pana`ewa on Saturday April 20th. We met around 9 AM to pull weeds and plant a variety of different food and fruit trees. The day ended around 2 pm and was a wonderful experience for everyone.

Earth Day at Island Naturals April 20th 10am-2pm
The Agriculture Club highlighted the College of Agriculture with some display boards, and posters of the Ag Clubs participation with the community within this school year at the Earth Day affair on Saturday April 20th from 10am-2pm.

Market Day Harvest April 21st 2pm-4pm
We harvested a variety of greens and fruits from the Pana`ewa farm to sell to the Slow Foods organization in Waimea. The Charter School Kanu o ka ʻāina will graciously donated money to our club as a big mahalo for our kōkua with their Earth Day event on April 22nd and the native plants outplanting we’ve done in the past. We harvested Sunday April 21st at the farm from 2pm-4pm.

Kanu o ka ʻāina Earth Day April 22nd 9am-1pm
The event was for k-12 and supported the kids knowledge of Hydroponics, Dry land Forest, Humane Society, Pu`upulehu Forest, UH-Agriculture, Kü ʻĀina Pā, Planting and Plant giveaway, tea station, make and take crafts, eco bags, solar ovens, and Earth Day Pledge reflection, all relating to Earth Day.

Senior Awards Night!!! May 10th 6pm-10pm
We will be congratulating 25 Seniors on Friday May 10th. We goin all out with Hawaiian Style lau lau dinner, fish, poke and live entertainment from the Visayan Club and Samoan Club. Look out for some talented acoustic performances from Kaipo Dye, Leina`ala Hall and various other performances from Michael Pierron and Yuri Zhuraw with much more to come. Hiki ia ʻoukou ke inu ma ka pāʻina;) Look out for updates on the imu at agclub-grp@hawaii.edu
Student Highlight: Pat Williams and Britton Clark  

By: Stephanie Anderson

Hawai‘i is a rich island and full of opportunities for agriculture students. Franklin Patrick Williams and Britton Clark Cole are two of these students, who are both living sustainably while studying at the University of Hawai‘i Hilo. Patrick has been grandfathered into the general Agriculture program. Initially he moved to Oahu from Massachusetts, to attend University of Hawai‘i Manoa to be close to family, then moved to Hilo for agricultural opportunities. When I asked him why he picked agricultures for his studies he said, “Figured the two best ways to make a difference in less privileged communities are agriculture and health care. Knew I wasn’t cut out for being a doctor so went with agriculture”. Patrick was driven to do either healthcare or agriculture because he lived in Africa for a few years when he was younger and saw how both of those issues can effect how people live. Since Patrick has been on the Island of Hawai‘i he’s gained experience in his field, he’s worked in nursery management, helped with forestry operations, also helps out local farmers, while working on his own farm and garden at his house growing food for himself and his pigs.

Patrick is graduating this May 2013 and his plans are to work for a forestry company in Paupilo, where he would be working on reforestation of Hawai‘i’s old growth native trees like Koa, and Ohia. Besides working in the fall 2013 Patrick plans on finishing one class at the university.

When I asked Patrick what his favorite aspect of agriculture was he responded “its hands on, outdoors, and simple”. On top of his studies at the University he has put a lot of time and love into his small farm, over the years he has worked a lot with animal husbandry specifically with, chickens, ducks, goats, sheep, and pigs. Patrick and Britton also have 22 dogs that they use for hunting wild boar. They have a large plot of sweet potato, with kalo and banana trees. They use that produce specifically to feed their pigs.

Patrick is not only a very hard worker but also he spends most of his free time helping his neighbors on their farms and hunting, or chasing his runaway pigs back to his property. His favorite plants are native plants, and he emphasizes the importance of saving the native forests with his work experience.

When I asked Patrick what his favorite class has been at the University he said, “I liked Tsang agriculture mechanics class. That table has been the most useful thing I’ve gotten from my degree. It’s a 20.00 dollar table at this point.” Patrick enjoys going up to volunteer at the Hakalau forest reserve and harvesting Kalo in Waipio valley with the Agriculture Club at the University.

Britton Clark Cole, roommate and good friend of Patrick is also in the College of Agriculture and Natural Resource Management here at the University of Hawaii Hilo. Originally from southern California, he moved out to Hawai‘i to study Coastal resource and watershed management.

Continued on page 6
Pamantasan Style, cont.

UH Hilo students, Marisol Alvarez, Nicole Kelley, and William Sabado, gave a rousing demonstration on permaculture or edible landscaping; allowing Pamantasan attendees to participate in beautifying the gardens fronting the Mo’okini Library Lanai. Next, conference participants were ushered to the diversified garden, located behind the CAFNRM building. Ag majors Kody Agbayani, Andrew Goodrich, and Chad Yamasaki encouraged groups to plant seedlings and prune herbs in order demonstrate the ease with which one family can garden an extremely limited space. Then, groups moved on to the vermicomposting site which is also located behind the CAFNRM building.

Two types of surface dwelling earthworms, Red and Indian Blue earthworms, process a portion of UH Hilo campus’ organic waste. Jake Rodrique and Madeline Stark, also Ag majors, dispelled myth, eased fears, and satisfied inquisitiveness by giving the participants the opportunity to feed the earthworms. Guides wrapped up the tour with a visit to the composting area, directly adjacent to the vermicomposting site.

This site features both an actively composting pile as well as a pile which is ready for use; both are comprised of newspaper, food wastes, and plant debris from the campus gardens and greenhouse. UH Hilo students Noel Dickinson and Malika Ross gave an entertaining and informative presentation about how participants can successfully create their own compost. Pamantasan attendees used shovels and pitchforks to turn both piles which added oxygen, an essential component of the composting process.

At the end of the day, the participants articulated how they could contribute to sustainability. With ideas inspired by the day’s events, the overall consensus was that more attention should be focused on supporting local products, reducing wastes, and sharing knowledge. One of the responses in particular sums it up best, “It means being able to support our human needs - such as food, economic, social, and political essentials...it is also important to go beyond sustainability and improve existing conditions” for generations to come.

Marisol Alvarez, AG 230 student, hosted a tour with Pamantasan participants (Photo credit: Tim Housman)
Oil Palm, cont.

It's true that the palms are heavy feeders. One redeeming factor is that the end product (oil) contains almost none of the plant nutrients, so potassium and phosphorus remain in the pressed fruit material and can be returned to the field. This practice is one part of a movement toward more sustainable production practices. The Roundtable on Sustainable Palm Oil has set modest standards for "sustainable" certification, but at least guides the industry away from the most noxious practices.

Hawaii is the only state in the US where oil palms can be cultivated. They prefer steamy jungle heat but can cope with the mild lowland climate here. Current yield estimates are around 500 gallons of oil per acre, which is lower than the best in Indonesia but still pretty nice but still pretty nice. No one has figured out how to mechanically harvest oil palm fruit. As with sugar, labor costs will make it uneconomical here unless oil prices (food or fuel) go way up. Which, someday, they will. Waiakea research station has a test plot of hybrid palms, and Mahilani permaculture farm has planted hundreds of them to provide low-emissions fuel for its farm equipment.

There are three trees on the UH Hilo campus, just off Lanikaula street to the right of the entrance to the Hale Kehau dining hall parking lot. They’re wild-type and probably suffer from poor pollination, but check them for fruit bunches at the leaf bases. Think of them as small orange avocados.

The nascent Ho'oulu student-operated permaculture farm team just acquired a few dozen high-yield hybrid seedlings (kindly provided by Hawaii Pure Plant Oil), spares from former Dean Bill Steiner's promotion work a few years ago. The group plans to grow about 15 trees on the farm, located on Shipman land near Kea'au, and experiment with intercropping and small-scale oil extraction and processing methods. When the trees begin to bear fruit in a few years they may produce raw material for all the biofuel the farm needs. That's good for reducing the carbon footprint. And we're going to make some rich stew.

Student Highlight, cont.

When I asked Britton why he enjoys agriculture he said “I like being outside working with the land and especially in the forest, plus everyone I knew in the College of Agriculture and Natural resource management program seemed pretty cool so I figured I’d give it a try”. When Britton graduates he plans to work for the nature conservancy or for one of the watersheds, “as long as it’s not sitting at a desk”. Britton will be graduating from the university in 1½ years. Britton is working on mapping trails where he hunts in the Hilo forest reserve and taking data on Koa trees for a GIS map.

This is important for his because there was recently the biggest outbreak of Koa moths ever recorded on the island. Along with Patrick he likes working on their farm, he says “we always have side projects going on so there’s always something to do, and anytime we want to do research on something we just try it out on our farm”.

Both Patrick and Britton are amazing agriculture students that are taking what they learn at the university and practicing it in their everyday life. From animal husbandry to produce production for human and animal consumption their lives are filled with sustainable agricultural practices. Their passion for native plants and reforestation of the big island is clear, and I see big futures for both of these students. Hawaii is the only state in the US where oil palms can be cultivated. They prefer steamy jungle heat but can cope with the mild lowland climate here. Current yield estimates are around 500 gallons of oil per acre, which is lower than the best in Indonesia.
Student volunteers from Hort 262 Class

By: Sara McCaffery

Norman Arancon’s Horticulture 262 (Introduction to Horticulture) class is composed of an enthusiastic group of people. The class holds an interesting dynamic where the students are eager to learn and the professor is dedicated to sharing as much knowledge as he can. The students even offer some of the things they have learned from experience that can be applied to the course on a daily basis. Over the semester we have been meeting for lecture and gaining hands on practice at Pana’ewa farms and working on our individual plots while also learning various methods for cultivating agriculture crops.

On Sunday, April 7th Norman Arancon presented the Horticulture class with an opportunity for community service on a community garden of the church in Kea’auhaha. Mary Gate of Heaven Parish, or Malia Puka’ O Kalani Parish has a program where they grow food to feed the homeless. Madeline Stark, a student in Hort 262, when asked what activities were undertaken while at the church responded with “the general caretaking that needed to be done like weeding, harvesting vegetables that were ready and any other kind of manual labor. We also had plenty of time to learn and talk from our hosts at the church.”

I asked Madeline, “What were the most interesting or valuable things you learned from volunteering at The Mary Gate of Heaven Parish?” Her answer was “The most valuable piece of knowledge I gained from this experience is that everyone can come together and work in harmony from all walks of life, no matter their differences or background, for the greater good of humanity. That was definitely the biggest thing I concluded after that experience. The most interesting thing I learned was honestly about the meaning behind the green ti leaves and the multiple ways they can be used. I learned that the Hawaiians use them to bring good luck and even use them as medicine for fevers and as tea for calming nerves. I never knew these uses and I was thankful to learn about such an old remedy to illness.”

I asked Madeline if she had ever done anything like this before or if she had any other experiences in life to prepare her for this and surely she did. She replied with “I’ve always been involved with my own garden at home and my families as well so I’m no stranger to farming. Besides that I’m currently in Sustainable Agriculture and the things we have learned while working in our plots over the semester were definitely able to be applied in the church’s garden.” So finally when I asked Madeline what her favorite part of the entire experience was she responded with “being able to witness an enormous amount of community effort. It was so great to see people from the class take time out of their day to help the cause there. Some just genuinely wanted to help. Overall the volunteer event brightened my day and it will be an experience I remember for years to come.”
The Leafminer: A Persistent Pest in Many Hawaiian Gardens and Farms

By: Malaika Ross

When I planted my first garden in Hawai‘i, all the plants took off right away. I assumed gardening in this tropical environment would be a breeze! But almost overnight, strange looking white patterns appeared on the leaves of various plants. The white patterns resembled hollow, thin and winding pathways along the interior and exterior of the leaf. I described this leaf pattern to a fellow student and she told me these were the signature pattern of leafminers.

Leaf mining insects are found on every Hawaiian island and attack a large variety of crops. Leafminers are actually young insects or larvae, which reside in leaves and consume leaf tissue for nourishment. As these young insects eat away at leaf tissue, tunnels are created within the leaves which are fairly easy to spot. The pathways or feeding tunnels are unique for each genus of leafminer. Most leaf mining insects are moths (Lepidoptera) and sawflies (Symphyta), but in Hawai‘i the majority of leafminers are flies (Liriomyza sativae) — a vegetable leafminer. Although leaf mining patterns can be intriguing, leafminers can actually devastate a garden or farm by consuming all the leaves on plants.

Since leaf mining insects reside within leaves, leafminers are also protected by leaves and this makes it difficult to get rid of them. The good news is that there are non-chemical methods to keep leaf mining infestations under control. Gardeners and farmers can prevent infestations by planting sacrificial plants, which will attract leafminers. For example, many leafminers are attracted to lambsquarter, columbine and velvetleaf. Simply plant these sacrificial plants adjacent to the crops you plan to harvest and this keeps leafminers occupied with the sacrificial plants and away from your cherished vegetable plants.

If you prefer to enlist the assistance of parasites, Opius dissitus Muesebeck, a wasp and leafminer parasitoid, can definitely do the job (Mau et al. 2007). Leafminer parasitoids lay eggs in leafminer larvae. The Leafminer parasitoids then feed off of leafminer larvae, eventually killing leafminers in the pupal stage. Leafminer parasitoids can be a surprisingly effective bio-control against leafminer infestation.

If your garden or farm has only a few leafminers inhabiting your plants, you can try snipping off the infested leaves and immediately disposing of them in an area far from your garden or farm. More information about leafminers can be found by completing an on-line search or by checking your local library. Happy Planting!