



Community Connections

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Aloha kākou!

I hope you all had a good start to the year. CTAHR Maui Nui certainly did with Dr. Javier Mollinedo joining us as the Urban Horticulture Agent and Mr. Nielsen Kawehi Horner as the Operations Coordinator on Moloka'i. We are happy that Javier and Kawehi are part of our team as their roles are very important for our programmatic and operational needs.

We are recruiting for the Livestock, Farm and Consumer Food Safety, and Agriculture Production and Farm Management Agent positions for Maui County. Hopefully, we will be fully staffed very soon.

I am excited to share that the Maui County Department of Agriculture has approved its annual grant to support our programs on Maui and also awarded a small grant for a youth innovation project, "Empowering youth through innovation for Maui's future." This project allows the Maui youth to learn about water scarcity and food insecurity in the County and explore innovative solutions. These are priority topics for the state, CTAHR, and Maui, and help promote new ideas and leadership among students. Complete details of this project can be found in this newsletter. We are grateful to the county agriculture leaders for their continued support.

I have recently been added to a project as a Co-PI with Dr. Pascal Aigbedion-Atalor for managing nursery, floriculture, and edible crop pests. This project is funded by the Hawai'i Department of Agriculture and Biosecurity to work on fruit fly suppression, monitoring and addressing emerging pests, and improving biosecurity capabilities in the target crops. We are actively working with our CTAHR team members and stakeholders on the next steps of this project.

We had the pleasure of meeting Congresswoman Jill Tokuda at a listening session organized by the Maui County Farm Bureau in late January. Dean Grewal also shared his vision for CTAHR with the Congresswoman and stakeholders. Dean Grewal visited Maui again in February when he met with students at some high schools to talk about the new 3-year BS program in agriculture and the summer research internships.

All of us at CTAHR appreciate the continued collaboration and support from various groups and individuals as we strive to serve our local communities in every aspect possible.

Surendra Dara

Maui County Administrator
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Aloha from Moloka'i

Nielsen Horner, Operations Coordinator



Aloha, My Name is Nielsen Horner, also known as Kawehi. I am from the island of Moloka'i and am the new Operations Coordinator based on the island, but serving the entire Maui County operations of CTAHR.

I bring over 20 years of experience working with various agriculture companies, including Coffees of Hawai'i, Monsanto, and Bayer. Throughout my career, I have been involved in growing coffee, corn, and soybeans, working across all stages of production- from planting and harvesting to processing and shipping. These roles allowed me to gain extensive experience both in the field and in office settings, working with computers, data, people, and professional networks.

I enjoy spending quality time with my family and animals, participating in community leagues to stay active, riding horses, and caring for my yard. I am excited to be part of CTAHR and am grateful for this opportunity. I look forward to networking, continuing to learn and grow, and contributing to the sustainability of a strong and supportive program.

Excited to join CTAHR

Javier Mollinedo, Assistant Extension Agent -Urban Horticulture

Aloha Maui Nui Community,

It is an honor to introduce myself as your new Urban Horticulture Associate Extension Agent and Master Gardener Coordinator. With a career dedicated to sustainable agricultural systems and plant science research, I am eager to apply my experience to serve the diverse needs of Maui, Moloka'i, and Lāna'i.

My professional philosophy is rooted in the belief that education is the bridge between scientific innovation and environmental stewardship. I join the Cooperative Extension team with a deep-seated commitment to protecting Hawai'i's unique ecosystems through evidence-based horticultural practices.



My journey in the islands began more than ten years ago, following the completion of my Ph.D. in Plant Science at South Dakota State University. Since then, I have contributed to the Hawai'i agricultural community through several roles:

- Most recently, I was the Aquaponics Coordinator and Trainer at UH Maui College, focusing on intensive and sustainable food production systems.
- In 2023 and 2024, I worked alongside Hawai'i Farmers Union United (HFUU) under the Climate-Smart Commodity Grant, advancing initiatives to reduce greenhouse gas emissions and enhance water quality.
- As a Junior Researcher at the CTAHR Komahana Research Extension Center, I led specialized research on canopy management, soil density, and water infiltration. My work involved extensive field collaboration with producers across the Hāmākua Coast, Puna, Ka'ū, and Kona.
- My foundational formation in Veterinary and Animal Science includes extensive work with dairy, pig, and poultry farms and specialized work in freshwater aquaculture, providing me with a holistic view of integrated biological systems.

I am committed to the principle, “He ali'i ka 'āina; he kauwā ke kanaka” (The land is chief, man is its servant).

My personal goals include:

- Elevating my leadership style that respects and integrates the unique cultural and agricultural heritage of Hawaii.
- Serving as a primary technical resource for urban agriculture and promoting the adoption of Integrated Pest Management (IPM) to reduce the chemical footprint in our local landscapes.
- Ensuring our programs remain at the forefront of the field by contributing to Extension publications and scholarly research that address the specific challenges of our region.

Being part of the Aymara Native American community myself I feel a personal connection with the Hawaiian island. Relocating from Bolivia—a landlocked nation—to

Hawai'i has instilled in my family a profound appreciation for the ocean. During our time on the Hawai'i Island, we were active members of the Kamehameha Canoe Club, an experience that deepened our connection to the community and the spirit of the islands. We look forward to continuing this connection here on Maui.

I am eager to collaborate with you to foster a sustainable and thriving future for Maui Nui. Please feel free to reach out to discuss how the Master Gardener program and our Extension services can best support your efforts.

You can reach me at javiermt@hawaii.edu or (808) 244-3242 Extn. 229 or the Master Gardener program at mauimgco@hawaii.edu.



New CTAHR Maui team members Kawehi Horner, Javier Mollinedo, and Liangjie Dong during the welcome reception



Kawehi Horner looking ahead before the Moloka'i Paniolo Heritage Rodeo this past November -- a long-awaited return that brought riders together from across the Islands!

Ka Nūhou - Ka 'Āina Ho'opulapula o Maui (News from Maui Hawaiian Home Lands)

Gwen Morinaga-Kama -Jr. Extension Agent-DHHL

Kahikinui

On November 25, 2025, DHHL staff from Kapolei and Maui visited Kahikinui Homestead to assess resident needs, along with a visit to the newly completed community center and fog drip catchment. The group was hosted by 'Elama Farm, president of homestead association Ka 'Ohana o Kahikinui, and Donna Sterling, long-time Kahikinui resident, community organizer for Firewise and Resource Management, and Chair of the Maui County Board of Water Supply. Mahalo to Agricultural Specialist Lehuanani Abrigo, Acting Planning Program Director Lillie Makaila, Planner Julie-Ann Cachola, Cultural Resources Planner Ku'upua Kiyuna, Hazard Mitigation Specialist Jenna Domingo and Maui DHHL District Office Supervisor Germaine Balino for joining us.

Kēōkea

Kēōkea Farm Lots Association has been awarded an 'Oiwī Resources Grant from Maui County to expand Malalani – Kēōkea Homestead's community garden this year, with grubbing and removal of invasive Black Wattle trees as well as runoff mitigation from Kula Highway.

Kēōkea Farm Lots Association Board members Pi'ilani and Alike Akana, with family members and a Junior Extension agent funded by the DHHL, plan to start a limu restoration project on the coastline of Kula Kai. They are also exploring the possible restoration of the Kēōkea Kai Fishpond; the project would involve contracting a drone operator to survey the coast, to see where the remnants of fishpond walls are located. Kēōkea Kai fishpond is one of the "Four Royal Fishponds" found in Kīhei. Ko'ie'ie has already been



DHHL staff with 'Elama Farm and Donna Sterling

restored by 'Ao'ao o Nā Loko I'a o Maui – Maui Fishpond Association. In keeping with the mauka to makai – ahupua'a system of sustainability, the Kēōkea association hopes to be able to feed its residents as well as to pass on the 'ike (knowledge) of limu (seaweed) and loko i'a (fishpond) construction, stocking, and raising pond fish.

Paukūkalo

Paukūkalo Homestead Association applied for and was also awarded a County of Maui Department of 'Oiwī Resources grant for planting projects. The Association is collaborating with the Homestead Community Development Corporation (HCDC), a Native Hawaiian nonprofit formed under the Sovereign Council of Hawaiian Homestead Associations (SCHHA) that addresses the housing, economic, and capacity-building needs within the Hawaiian community to fulfill the goals of the Hawaiian Homes Commission Act of 1920.

The HCDC is assisting Paukūkalo in gaining right-of-entry to the former National Guard Armory, 1.77 acres which has been fallow for years and listed as an EPA "brown fields" site. Formerly used as an automotive repository for the Guard's vehicles and refueling station, it is a property that could be contaminated. The Maui United Way with Hā Sustainability are working to obtain an environmental assessment to determine what contaminants are in the soil. HCDC will replace the dilapidated chain link fence that surrounds the site.

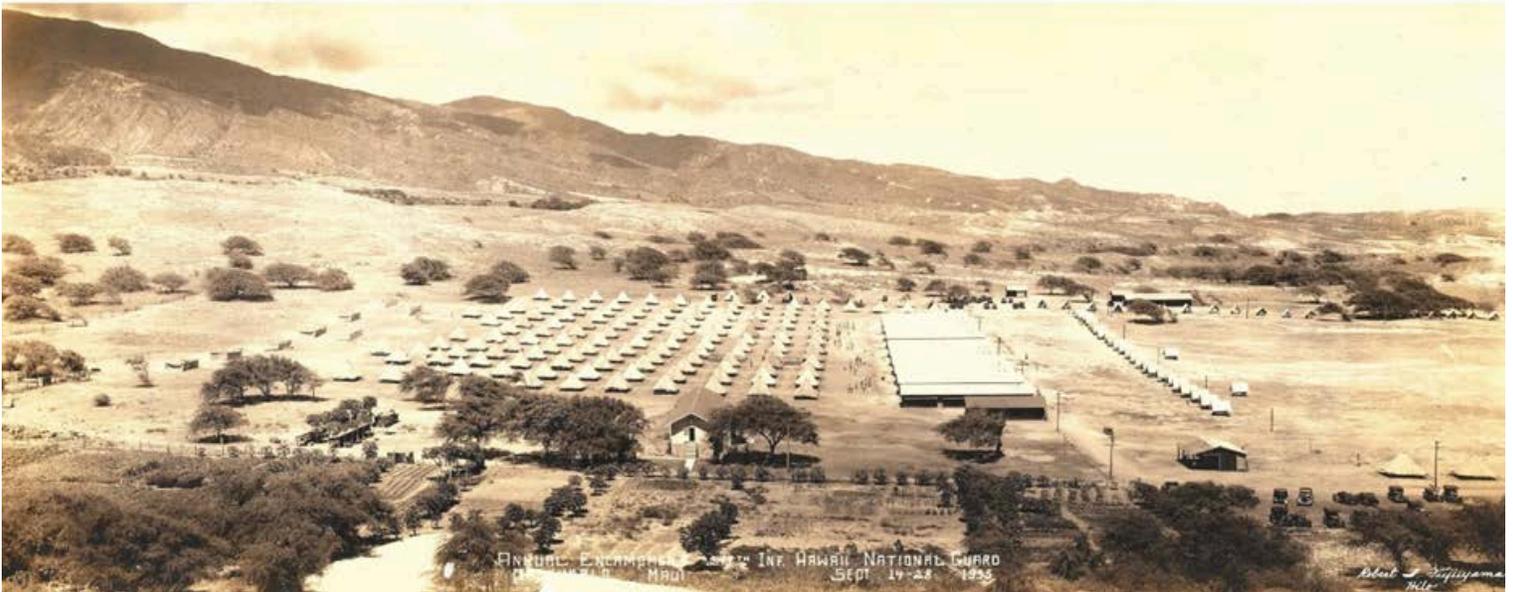
The Paukūkalo Annual Ho'olaule'a will take place on March 21 from 3 to 6 p.m., with local music, food trucks, educational booths, and activities for the keiki. According to board member Janice Herrick, this year's event is intentionally smaller and more community-oriented than previous celebrations that drew families from across Maui.



Kahikinui Domestead Community Center



Paukūkalo residents Gracey Gomes, Janice Herrick, and Leiana Sing-Keliikoa at the former National Guard armory that operated in their neighborhood for decades. Photo: HJI & COLLEEN UECHI



The annual encampment of the 299th Infantry is seen at Camp Paukūkalo in September 1935. Photo: Hawai'i National Guard Archives



Goats help control overgrown vegetation wander next to heavy equipment near former National Guard armory in Paukūkalo on Sept. 13, 2025. Photo: HJI & COLLEEN UECHI



Hannah Shipman-Peila, co-founder and principal of Hā Sustainability, explains what a brownfield is during a workshop in Kahului on Sept. 13, 2025. Photo: HJI /& COLLEEN UECHI

Fruit fly pests on Maui and their management

Surendra K. Dara, Maui County Administrator

The oriental fruit fly (*Bactrocera dorsalis*), the Mediterranean fruit fly (*Ceratitis capitata*), and the melon fly (*Bactrocera cucurbitae* or *Zeugodacus cucurbitae* according to a new classification) are some of the fruit fly pests on Maui attacking various species of fruits on farms, in the backyards, urban landscapes, and wherever their food source is available. When their infestations had become a serious concern in Hawai'i a few decades ago, the HAW-FLYPM, a statewide integrated pest management (IPM) program, was initiated in 2000 to suppress these pests. This collaborative project among USDA-ARS, Hawai'i Department of Agriculture and Biosecurity (HDAB, formerly Hawai'i Department of Agriculture), and CTAHR successfully suppressed fruit fly populations by using an area-wide IPM approach that used sanitation practices, baits, mating disruption, sterile insect technique, and biological control, supported extensively by a strong education and outreach component. As the fruit fly problems appear to be re-emerging in recent years, CTAHR has initiated a new project, funded by HDAB, to assess the status of fruit fly problem, update management strategies, and extend the information to the farmers and the general public. Dr. Pascal Aigbedion-Atalor, CTAHR Specialist based in Hilo, and I are leading this project working with the extension agents and stakeholders in different counties.

These three species of fruit flies attack a wide range of fruit and vegetable hosts causing significant yield losses. In addition to commercial fruit and vegetable farms, home gardens, urban landscapes, and other locations can harbor and contribute to the fruit fly population buildup. Areawide management of such pests not only requires efforts from researchers and governmental agencies, but also the active participation local communities. This article provides a general overview of the pest biology and IPM options about each of the three fruit flies, as the first in the series of technical documents, to help increase the awareness of the problem, our efforts, and invite collaborations.

Mediterranean Fruit Fly

Also referred to as the Medfly, native to sub-Saharan Africa, is one of the most destructive and economically important fruit pests around the world. Among more than 300 hosts the Medfly attacks, avocado, citrus, coffee, fig, guava, papaya, persimmon, peach, pear, pepper, plum, star fruit, and tomato are some of the locally important ones.

Biology: Adult flies are slightly smaller than a housefly with a black thorax having silver markings and clear wings with brown bands and gray flecks. They generally stay near host plants but can disperse up to 12 miles and live for up to two months. Female flies deposit slender white eggs under the fruit skin in batches of 1-10. A single female lays 300-800 eggs in its lifetime. Larvae (maggots) emerge in 1.5-3 days and feed on the fruit pulp. Mature larvae exit the fruit, drop to the soil, and pupate 1-2" under the surface. Depending on the temperature pupal stage can last from 6-30 days.



Mediterranean fruit fly (Photo: Karl Sauerbrey), Melon fly (Photo: NBAIR-ICAR), and Oriental fruit fly (Photo: Viwat Wornoyporn, IAEA)

Under optimal environmental conditions, Medfly can complete the life cycle in 21 days.

Damage: Small, sunken, discolored spots appear on fruits where eggs are deposited, sometimes with juice oozing out. Maggots tunnel through the fruit feeding on the pulp leading to fruit rot, deformation, and premature fruit drop. Feeding damage can also lead to secondary infections from bacteria and fungi. The extent of yield loss varies widely according to the host plant, growing season, geographical region, management practices, and other factors. While the global average loss is 10-30%, unmanaged populations can cause 100% yield loss.

Melon Fly

Native to Asia, now distributed in Asia, Africa, and the Pacific region, the melon fly is a devastating pest of several fruits and vegetables with a strong preference for cucurbits. Among more than 125 species of host plants, cucurbits such as cantaloupe, cucumber, gourds, squashes, and watermelon, and other hosts such as beans, citrus, eggplant, papaya, peppers, and tomato are vulnerable to melon fly damage.

Biology: Adult flies are about 6-8 mm long with yellowish-brown body. Yellow markings on the thorax and a black T-shaped pattern on the abdomen are characteristic of this fly. They are strong flyers and can live for over a year. Eggs are deposited 2-4 mm deep into fruit, flower, and stem tissues in groups of up to 37. A single female can lay up to 1000 eggs in its lifetime. Maggots emerge in 1-4 days and feed on fruit tissue. Mature larvae exit the fruit and pupate in the soil and can be found up to 15 cm deep. Pupal stage lasts for 7-13 days. The melon fly can complete its life cycle in 12-28 days depending on the environmental conditions.

Damage: Pin-prick punctures reveal egg laying sites, premature yellowing and scarring of the fruit, sunken, discolored, or water-soaked patches on fruits, and internal rot, and premature fruit drop are the symptoms of damage. In cucurbits, unmanaged infestations can cause 30-100% yield loss.



Persimmon farmer and former CTAHR Maui County Administrator, Clark Hashimoto, examining his fruit fly trap

Oriental Fruit Fly

The oriental fruit fly is another highly destructive pest with a wide host range of nearly 500 fruits and vegetables. It is native to Southeast Asia, but is now a problem worldwide. Avocado, banana, citrus, fig, guava, papaya, passion fruit, persimmon, pineapple, and mango are some of the important to Hawai'i. It also attacks vegetables such as bitter melon, pepper, and tomato, and stone fruits such as apricot, peach, pear, and plum.

Biology: Adults are yellowish-brown, slightly larger than a house fly, and have colorful markings. Its thorax is black and the abdomen has a characteristic T-shaped banding. They are strong flyers and can travel up to 30 miles. Female lays cylindrical eggs under the fruit skin in groups of 3-50 and can lay more than 1000 eggs in its lifetime. Maggots emerge in 1-2 days and feed on fruit pulp. Mature maggots exit the fruit and pupate 2-3 cm deep in the soil. Larval stage lasts for about 10 days, while pupal stage lasts for 10-12 days. Under ideal environmental conditions life cycle can be completed in 16-30 days. Adults can live for 3 months or longer and there are multiple generations per year.

Damage: Small, dark, decomposing spots and oozing where eggs are deposited, and water-soaked appearance of mature fruit are usual symptoms of damage. Larval tunneling and feeding on the pulp leads to fruit rot, deformation, and premature drop.

Fruit Fly Management

Integrated pest management (IPM) is always an ideal strategy for suppressing any kind of pest by taking advantage of various control options. Several IPM options are common for managing these fruit flies.

Cultural control: Sanitation by regularly monitoring for symptoms of damage, collecting and destroying infested fruit helps reduce larval emergence and population buildup. Similarly, destroying the unharvested or damaged fruit and cultivation of the soil to expose and destroy pupae also contribute to fruit fly reduction. Fruit removed during sanitation practices may be placed in “augmenteria”, cages from which biocontrol agents may escape and continue attacking flies, while flies are kept contained by the mesh used to make the structure.

Physical control: Bagging the fruit with paper or cloth bags minimizes egg laying and netting, when possible, can help with pest exclusion.

Biological control: Parasitic wasps that attack different life stages and predatory arthropods that can attack pupae and adults contribute to natural control. When biocontrol agents are active, strategize pesticide applications to reduce their impact on biocontrol agents.

Microbial control: Entomopathogenic nematodes can be used to control pupae in the soil. Entomopathogenic fungi such as *Beauveria bassiana* can also be effective against pupae and possibly adult flies.

Behavioral control: Adult flies are very attracted to protein-based baits, which can be used with insecticides to attract and kill both male and female flies. Methyl eugenol is highly attractive to the males of the oriental fruit fly and used in the attract-and-kill strategy. Species-specific lures can also be used in traps both for monitoring pest populations or for trapping flies, when used widely enough within or next to orchards.

Chemical control: Synthetic chemicals such as malathion or organic pesticides such as spinosad can be sprayed or added to the protein bait for controlling adult flies. It is always important to check the pesticide labels for appropriate use.



Mediterranean fruit flies (large ones) and other fruit flies caught on yellow sticky trap in Clark Hashimoto's persimmon farm.

Advanced control: Where possible, male flies can be mass-reared, sterilized by exposing to radiation, and released in multiple areas. They compete with wild males in mating with wild females, but are unable to produce fertile offspring contributing to population reduction. This technique is commonly used in area-wide management by governmental agencies.

Since fruit flies are not limited to farms and can infest fruits and vegetables in home gardens and urban landscapes, everyone's cooperation is necessary in their area-wide suppression. When the general public and the farming community work together by sharing the information and following good IPM practices, areawide suppression of fruit flies will be successful. Overall, sanitation is one of the most important IPM practices in suppressing fruit fly populations, so regularly monitoring and destroying infested fruits can reduce the reliance on other expensive control options.

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GoFarm Hawai'i: Maui site quarterly update

Lily Nguyen, Program Manager

Amid growing momentum for local agriculture on Maui, GoFarm Hawai'i's Pūlehunui training site continues to expand its impact by preparing the next generation of farmers with hands-on training, business development support, and strengthened community partnerships.

AgXcel Program Updates

AgXcel Cohort 10 gained practical farm-to-market experience through their annual communal crop project, growing and selling 644 pounds of beets and producing value-added pickled products from off-grade produce. The project strengthened students' understanding of production costs, marketing, and product diversification.

In February, the cohort launched a seven-week Community Supported Agriculture (CSA) initiative, with each participant providing seven customers with weekly produce shares featuring a diverse selection of crops grown on each student's 1/16th acre training plot at the GoFarm site. Students also received in-field instruction on cropland soil health analysis from Jason Hew of USDA-NRCS, building skills and connections that support long-term farm productivity.



AgXcel students prepare weekly CSA shares and participate in field-based instruction, gaining hands-on experience in production, post-harvest handling, and soil health practices

AgIncubator Highlights

AgIncubator farmers continue to expand their businesses and increase access to locally grown food across Maui. Chris and Damaris McGee of Maui Co. Farms recently launched the Central Valley Farmers Market at the Maui Humane Society, every Saturday



GoFarm-supported farmers Jennifer Lee of Aloha Wei, Chris and Damaris McGee of Maui Co. Farms, and Christy Inda of In Da Garden bring fresh, locally grown produce to community markets across Maui (above). The Screenhouse Course gave people hands-on experience constructing a 30-by-100-foot high tunnel screenhouse (below)



from 9 a.m. to noon, while Christy Inda from In Da Garden joined Kollab Maui's Farmers Market, every Sunday 8:30 a.m. to 12:30 p.m. in Wailuku, as one of its first vendors.

Produce grown by GoFarm AgIncubators is also available at Maui Hub, Hawaiian Moon Natural Foods, Kō Mahi'ai Makēkē in Kihei, Wednesday Upcountry Farmers Market, and Pukalani Superette.

GoFarm Hawai'i delivered a four-week, hands-on screenhouse construction course guiding participants through the full process of planning and constructing a high tunnel structure at the Pūlehunui training site. The course was led by GFH Maui Farm Coach Jake Sipes alongside current AgIncubators Christopher and Damaris McGee of Maui Co. Farms, whose growing operation has been supported by the County of Maui. Participants gained practical experience in farm infrastructure development and developed skills they can use at their agricultural operations.

PŪLEHUNUI, MAUI



Upcoming Cohort 11 Dates:

- AgCurious [Informational Webinar] 9.3.26
- AgXposure 9.17.26 - 10.24.26
- AgXcel 1.7.26 - 7.17.27

Upcoming Events and Opportunities

Pūlehunui's next farmer training cohort will start in Fall 2026!

Cohort 11 Dates:

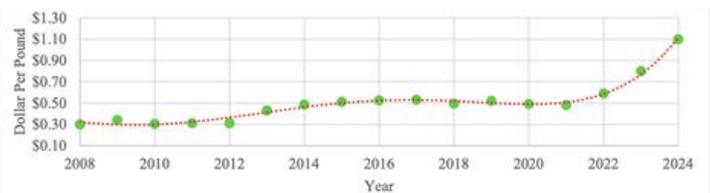
- AgCurious (Informational Webinar) 9/3/26
- Applications open 9/4/26
- AgXposure 9/17 - 10/14/26
- AgXcel 1/7 - 7/17/27

GoFarm Maui will host an Open House on March 7, inviting prospective students and community organizations to tour the Pūlehunui site, meet AgXcel and AgIncubator participants, and learn more about joining the training program or exploring partnership opportunities. The event will also feature a student-run pop-up farm stand with fresh, onsite-grown produce available for purchase. Additional workshops, including AgOrchard, a bubbler and greens spinner workshop, and a beekeeping course, are planned for 2026 to further expand educational offerings. To learn more or sign up for an event, visit gofarmhawaii.org, follow [@gofarmhawaii](https://www.instagram.com/gofarmhawaii), or contact info@gofarmhawaii.org.

Imported cabbage worm

Jennifer Hawkins, Junior Extension Agent-Edible Crops

Head cabbage (*Brassica oleracea* L. var. *capitata*) is a major crop for Hawaii, with an estimated 4.2 million pounds harvested in 2024. (State of Hawaii Department of Agriculture & Biosecurity). Since 2008 the actual production has dropped, however the price has increased from \$0.30/lb in 2008 to \$1.10/lb in 2024. (State of Hawai'i Department of Agriculture & Biosecurity).



Head cabbage pricing from 2008 to 2024 (State of Hawaii Department of Agriculture and Biosecurity)

Cabbage is a member of the brassica family, which also includes Brussels sprouts, broccoli, cauliflower, kale, collards, choy sum, daikon, mustard, pak choy, radish, kohlrabi, and turnips. While Hawai'i's tropical climate allows us to grow cabbage year-round, it also allows year-round pest pressure with insects like the diamondback moth (*Plutella xylostella*), the imported cabbageworm (*Pieris rapae*), the cabbage webworm (*Hellula undalis*), and the cabbage looper (*Trichoplusia ni*) causing major damage to the brassica family.



Diamondback moth larva (top left), imported cabbageworm larva (top right), cabbage looper larva (bottom left), size comparison of various species (bottom right, photo: Yurchak)



Larval damage and droppings, chrysalis, and adult imported cabbage worm (Photos: J. Hawkins)

On Moloka'i, the most recent damage we are seeing to our cabbage and other brassica crops is from the imported cabbage worm. This pest is very common to all parts of the US and Canada and was first recorded in Hawaii on Oahu in 1897. It is now found throughout the island chain.

Damage is often recognized by the irregularly sized holes on the outer leaves where the worms are chewing from the edges, giving a ragged appearance (Mau et al.). As the worms mature you will find more and more greenish to brown excrement on the leaves.

Life cycle can take 4.5 to 7 weeks to complete depending on the temperature. Yellow, football-shaped eggs are deposited individually on the lower side of the leaves and hatch in 3-7 days. Larva is green with a slender yellow stripe along the middle of its back and along each side of its body with a velvet-like appearance. Larva increase in size from 1/15 of an inch to about 1 inch in just 2 weeks. During their development they crawl slowly and feed heavily on the leaves.

The pupae is called a chrysalis and is generally green, but can appear gray to tan. The chrysalis is distinctly shaped with sharp angles at either end, attached to the underside of leaves by silk strands at the tail and midsection. They are about $\frac{3}{4}$ an inch in length and develop in 1-2 weeks. Interestingly the pupa can be found on the host plant or may choose to shelter on adjacent plants.

Adults can be seen fluttering near brassica crops as white butterflies with a wingspan of 1.5 inches. Their forewings are black tipped, with the female having 2 black spots on the top of each forewing and the male only having one spot on the top of his forewings.

The hindwings are all white on the topside with the exception of a black spot on the outer front margin. The underside of the wings can have a yellowish appearance. A female adult lays hundreds of eggs, and the cycle begins again. In Hawai'i, this is typically year-round with overlapping generations. Adult females can be seen out during the day and fly in an erratic pattern in the field as they lays eggs and return to feed on nectar, while the male flies in straight lines and remains in the field. (Mau et al., 2007)

Control Options

Companion planting involves interplanting with plants that attract beneficial arthropods like predators and parasitic wasps, or interplanting crops that deter the actual pest. Cabbage worm adults don't like strong aromatic plants, so certain herbs can be interplanted to deter the adult from laying their eggs on the brassica where the herbs (ex. Thai Basil) are interplanted as a companion crop. Rosemary, sage, and thyme would work well. Marigolds work well as a deterrent; however, they are often known to harbor spider mites, which is when you have to pick and choose your battles wisely.

While crop rotation and cover cropping are common recommendations for soil health, in the case of the cabbage worms, these practices play a role in breaking the life cycle, which in turn lowers the populations.

Physical barriers such as the row covers prevent insect access to the plants. There are many row cover options to choose from so do your research. Sometimes due to shipping, we simply must make due with what we have. For suggestions, contact me at the office.

Trap crops such as alyssum, buckwheat, mustards, and radish can be another great tool. A trap crop is grown specifically to draw the pest to another area. Once the pest is present on the trap crop at a high enough threshold, you can pull out the crop, spraying the insects on the trap crop, or chemically terminating the trap crop.

Light traps are another great tool you can set up away

from the main crop and lure insects away from the main crop. Biological control is taking advantage of birds, bats, parasitic wasps, and predatory arthropods while microbial control involves using bacteria, viruses, or fungi. Your beneficial insects/biological insects will need plants to sustain them when the worm numbers are low. Planting nectar producing flowers will help attract and sustain them.

Another option is using pheromone traps, which disrupt the reproductive cycle by emitting a scent to attract the male cabbage moth, therefore preventing the male from fertilizing the egg of the female. Organic and synthetic pesticides have different modes of action and it is always important to read the pesticide labels guidelines and remember that Label is the Law! For more information contact Jennifer Hawkins at 808-567-6929 or jhawk@hawaii.edu

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Row covers (Photo: K. Franks)

Brain-healthy habits for resilient Maui

Heather Greenwood, Associate Extension Agent-Aging/Intergenerational Programs

In 2024, CTAHR was officially renamed the College of Tropical Agriculture and Human Resilience (formerly Human Resources), reflecting our land-grant mission to strengthen both agricultural systems and the people who depend on them – everyone who eats food! The name change highlights that true community resilience depends on more than healthy soil, crops, and livestock. They also depend on strong youth development, family well-being, nutrition and health education, food systems support, and engagement across generations. Cooperative Extension works statewide to build knowledge, skills, and connections that support communities from keiki to kūpuna.

One example of this human resilience work in Maui County is the 2026 Brain Health Lunch & Learn Series, a seven-month educational program offered in partnership with the Alzheimer's Association Aloha Chapter. Dementia is not a normal part of aging, yet it remains one of the most feared health conditions. Its impact extends beyond medical costs to caregiving demands, family stress, loss of cultural knowledge, and community stability. Addressing a condition of this scale requires action at multiple levels. At the macro level, researchers continue to study causes, treatments, and early detection. At the policy level, Hawai'i has strengthened support for early identification of cognitive changes through recent legislation related to Medicare Annual Wellness Visits. At the micro level, individuals can translate reliable information into protective habits practiced consistently over time. This is where the Brain Health series fits.

Rather than focusing on fear, the series highlights research-based behaviors that support long-term brain health. Brain health is not something to consider only at retirement. It is a lifelong pursuit, shaped by how we move, eat, learn, sleep, connect with others, and manage overall health over decades.

Beginning in April, adults of all ages are invited to participate in monthly sessions designed to build sustainable brain-healthy habits. Workshops are held during the lunch hour, 12:00–1:00 p.m., to accommodate working and retired residents. Participants may choose between two formats that cover the same content:

- In person: Third Thursday (April–October) at the Community Services Building next to the UH-CTAHR Extension Office in Kahului
- Virtual: Fourth Friday (April–October) via live Zoom

Each session combines current research with interactive learning, discussion, and structured goal setting. Participants leave with a personalized action plan to support lasting change.

The 2026 series includes:

- April – Building Brain-Healthy Habits: Learn basic brain science and the Alzheimer’s Association’s 10 Healthy Habits framework.
- May – Get Moving: Practice aerobic, strength, flexibility, and balance activities that support blood flow and cognitive function.
- June – Balance: Strengthen coordination and stability to support neural connections, reduce fall risk, and maintain independence.

- July – Challenge Your Mind: Use intentional lifelong learning strategies that build cognitive reserve and mental flexibility.
- August – Eat Right: Explore practical nutrition strategies that nourish the body and support brain health.
- September – Know Your Numbers: Identify key health indicators and partner effectively with healthcare providers.
- October – Celebrate Success: Reflect on progress, reinforce motivation, and set future brain-health goals.

No single strategy can prevent dementia or cognitive decline. However, consistent healthy living across the lifespan can help lower the risk and support overall well-being. Brain health is built one habit at a time.

Workshops are free, but registration is required. Register at <https://go.hawaii.edu/c4D> or contact Heather Greenwood for additional information, 808-269-7396 or heather8@hawaii.edu.

Pack your lunch, invite a colleague or friend, and join us in strengthening both agricultural and human resilience in Maui County.



Fourth Annual Maui MG Mother's Day Plant Sale

Kate Ancheta, Master Gardener

The Maui Master Gardeners are looking forward to the 4th Annual "Mother's Day Plant Sale" held the day before Mother's Day at UH-Maui College. The sale takes months of planning and the Plant Sale Team is hard at work organizing and preparing for this wonderful community event. Our goal for this event is that it becomes familiar to, and is anticipated by, the public each year.

We offer plants and edibles that are not usually found in the big box stores, beautifully handcrafted gift plants just in time for Mother's Day, as well as our own Maui Master Gardener Honey for sale.

The Maui community can enjoy educational demonstrations such as Fruit Fly Management, address

their gardening questions at our "Ask a Master Gardener" tent and, this year, there will be a lei making demonstration by our own talented members. The Maui Master Gardener's mission for the annual plant sale is to project a professional and organized image to the public while assisting with our community's gardening needs. Mark your calendars for Saturday, May 9th, 2026!

Creative outreach with AI



<https://www.youtube.com/watch?v=hHaM5UkVW0I>

Water Quality Agent Liangjie Dong is a true innovator, weaving technical expertise with a deep appreciation for Hawai'i's natural heritage. While actively expanding his network of stakeholders and collaborators, Liangjie is constantly developing creative solutions for the state's water challenges and seeking new ways to engage the community through outreach.

Recently, he channeled this creativity into a lyrical tribute to the naupaka, a native plant abundant along Hawai'i's coastlines. With the assistance of AI, he transformed these lyrics into a moving song titled "Naupaka: Half Devotion, Half Wisdom."

The naupaka is famous for its unique half-flower appearance, which looks as though it has been torn in middle. According to Hawaiian legend, this shape symbolizes two lovers separated by a jealous goddess—one banished to the mountains and the other to the sea—each blooming with only half a blossom.

Subscribe to his HIWaterAndPlants YouTube channel at <https://www.youtube.com/@hiwaterandplants>

The poster features the Maui Master Gardeners logo (a stylized orange flower) and the University of Hawaii logo. The text reads: "Maui Master Gardeners", "Mother's Day Plant Sale", "When: Saturday, May 9th, 8:00am to 3:00pm", "Where: UH Maui College Campus, 310 Ka'ahumanu Ave. Kahului". A photo shows various potted plants. At the bottom, it says "FIND UNUSUAL PLANT VARIETIES" and lists "Native & Endemic Plants", "Succulents & Flower Baskets", and "Hard to find vegetables".

Empowering Youth Through Innovation for Maui's Future

Water scarcity and food insecurity are among the most pressing challenges facing Maui today. Researchers and educators at the University of Hawai'i at Mānoa's College of Tropical Agriculture and Human Resilience (CTAHR) in Maui County, in collaboration with schools, community colleges, government agencies, private organizations, and community groups, are working to develop sustainable, locally driven solutions.

With support from a grant awarded by the Maui County Department of Agriculture, CTAHR–Maui Nui invites Maui County middle school, high school, and undergraduate college students to participate in a Youth Innovations Challenge focused on practical, scalable solutions for Maui Nui's future.

This challenge encourages youth to apply analytical thinking, creativity, and problem-solving skills while contributing directly to community resilience.

Challenge Focus Areas

Participants may submit proposals in one of the following categories:

- **Challenge A:** Harvesting Water from the Environment: Innovative systems or models that capture, store, or reuse water from environmental sources, particularly from the atmosphere.
- **Challenge B:** Vertical or Container Farming: Innovative approaches to food production using vertical, modular, or container-based farming systems.

Who Can Participate

- Individual or teams of students based in Maui County
- Participants must work under the guidance of a teacher, parent, or mentor with technical expertise (e.g., water systems, agriculture, engineering)
- Cross-school or cross-institution teams are welcome.

How to Apply: Letter of Intent

Interested participants must submit a Letter of Intent (LOI) by completing the online application form [HERE](#). Each LOI must include:

- Project Title
- Names of Participants and Affiliations
- Name(s) of Mentor(s)
- Project Outline (no more than 1,000 words), describing:
 - Your understanding of the selected challenge
 - The proposed model (new design or adaptation of an existing model, with permission)
 - Economic, social, and environmental relevance to Maui Nui
 - Efficiency and productivity
 - Estimated cost of construction
 - Development and demonstration timeline
 - How the solution can grow over time, increasing its community benefit
 - Potential impact on addressing water scarcity or food insecurity on Maui Nui
 - You may include 2-3 figures describing your model or project plan

Use of Existing Models

- If an existing or commercially available model is used, applicants must:
 - Provide the source and cost details
 - Obtain written permission from the inventor or manufacturer (if intellectual property rights apply)
 - Submit documentation by May 31, 2026

Selection & Support

- Up to **10 projects per challenge** will be selected to advance to the demonstration phase
- Letters of Intent will be evaluated based on:
 - Clarity and completeness
 - Innovation
 - Technical and economic feasibility
 - Team capability
 - Estimated development and operating costs
- Selected teams may receive up to \$2,000 in reimbursable funds per team to support project-related materials (receipts required)

General Guidelines

Here are a few general guidelines to help people apply:

- Use your imagination! Explore different ideas and solutions.
- Search online, get books from the library, or talk with people with experience in agriculture or water harvesting.
- Ask your teachers or parents to help you learn about these challenges.

Key Dates

- **March 31, 2026 – Deadline to submit Letter of Intent**
- April 30, 2026 – Project selection notifications sent
- May–October 2026 – Development and testing of demonstration models
- November 2026 – Final demonstration and presentation event (early November)

At the November event, projects will be evaluated on:

- Design quality and innovation
- Practicality and cost-effectiveness
- Scalability and economic impact
- Presentation and communication skills

Be Part of Maui's Sustainable Future

This challenge is an opportunity for Maui's youth to turn ideas into action, contribute to real-world solutions, and help shape a more resilient future for the island.

We encourage students, educators, and mentors to apply and innovate together.

If you have any questions, contact Surendra Dara, CTAHR Maui County Administrator, at sdara@hawaii.edu.



For Middle, High School & Undergraduate College Students Based in Maui County

An exciting grant program through the University of Hawai'i at Mānoa's College of Tropical Agriculture and Human Resilience (CTAHR) to design and build local solutions for water harvesting and food security.

**Use your imagination!
Explore ideas and solutions
to directly impact
community resilience.**



**Challenge A:
Harvesting Water
from the Environment**



**Challenge B:
Vertical or Container
Farming**

**APPLY
TODAY!!!**



**For more information
and to apply, go to:
<https://go.hawaii.edu/iDD>**

Food preference of little fire ant in Hawai'i

Jia-Wei Tay, Assistant Professor, CTAHR, UH Mānoa

Little fire ant (LFA), *Wasmannia auropunctata*, is a tiny invasive ant with significant impacts in Hawai'i. It often spreads by "hitchhiking" on potted plants, pallets, produce, and building materials. Its painful sting can harm people and pets, infestations in plants and yards can disrupt everyday activities, and continued expansion poses serious risks to agriculture and Hawai'i's native ecosystems. First reported on Hawai'i Island in 1999, LFA later made incursions to other Hawaiian Islands. Because this species can establish dense, hard-to-eradicate populations, early detection, rapid response, and prevention are critical to slow its spread and reducing long-term management costs. Efforts from state agencies and programs on O'ahu, Kaua'i, Maui, Moloaka'i, and Lana'i are still ongoing, aiming to prevent LFA from becoming widely established across the state.

Food preference may seem minor, but it can influence the ability to detect low-density infestations, the estimation of the size of infestation in surveys, and the control efficacy based on the amount of bait consumed. To help improve detection and management tools, in a laboratory study, we evaluated a wide range of common foods and asked a practical question: Which foods do LFA prefer the most?

Food preference matters for LFA surveys and control

- *Improving detection*: If the lure is only mildly attractive, ants may not recruit quickly, especially when alternative foods are available. Using more attractive lures can increase confidence in survey results and improve early detection.
- *Strengthening bait performance*: Baits work best when workers/foragers readily collect and distribute them within the colony. If the matrix is not appealing, ants may ignore the bait or collect too little to suppress the colony. Understanding nutritional preferences helps refine bait formulation.



Little fire ant (Photo: J.-W. Tay)

What we tested

In a recent study, we tested 24 foods that are commonly found in homes, gardens, and urban environments. Foods were grouped into three nutritional categories:

- *Protein-lipid-rich foods* (12 items): Examples included various cooked meats, seeds, insects, defatted peanut butter, etc.
- *Carbohydrate-rich foods* (8 items): Examples included sugars, honey, fruit products, soft drinks, etc.
- *Lipid-rich foods* (4 items): Examples included peanut butter oil (oil extracted from peanut butter), coconut oil, etc.

Using field-collected ants, in the laboratory, we evaluated food preference using two complementary approaches: 1) *Visitation frequency assay*: How many ants visited each food over time, and 2) *Foraging duration assay*: How long ants spent near or at each food, quantified using Noldus EthoVision video tracking software. Together, these approaches helped distinguish foods that merely attracted a few passing ants from foods that drove strong, sustained recruitment.

Across comparisons, several foods consistently stood out as top food candidates.

- *Protein-lipid-rich foods*: Cooked beef and sunflower seeds

Within protein-lipid-rich foods, cooked beef and sunflower seeds ranked among the most preferred items. When we compared leading foods across three nutritional categories, cooked beef also ranked highest overall.

- *Carbohydrate-rich foods*: Honey

Among carbohydrate-rich foods, honey was the most preferred option.

- *Lipid-rich foods*: Peanut butter oil

Among lipid-rich foods, peanut butter oil was the most preferred. Other oils attracted similar numbers of ants in comparison. In oily bait matrices, the oil source can matter. Peanut-derived oils may provide stronger attraction than some other oils.

Peanut butter is commonly used and work well in most situations. Our study included a defatted peanut butter fraction, which performed poorly, while peanut butter oil performed well. This suggests that lipid content and specific peanut-derived cues may be important drivers of attraction, and that not all peanut butter products perform the same in the field.

Field teams and monitoring programs: standardization and shelf-stability

Cooked beef can be highly attractive, but it is not always practical for large-scale programs due to spoilage risk, mess, and non-target attraction. For more standardized, shelf-stable options, consider sunflower seeds or honey or peanut butter oil.

Because ant surveillance occurs in many settings with different priorities, understanding food preferences helps tailor lures for each context, balancing effectiveness with practicality and convenience.

Quick self-survey at home, backyards, gardens

Note that this approach may not be applied for standardized, ongoing field-team surveys. Two lures in parallel may be considered as ant colonies can shift their foraging toward protein, lipid, or sugar depending on brood needs, colony condition, and food availability nearby. Pairing food from different nutritional categories may increase strong recruitment during a short survey window in certain situations.

Implications for baiting and control

Food preference data provide a foundation for refining bait formulations and field protocols, but successful control still depends on correct application rates and protocols, active ingredients, coverage, follow-up, and reinvasion prevention.

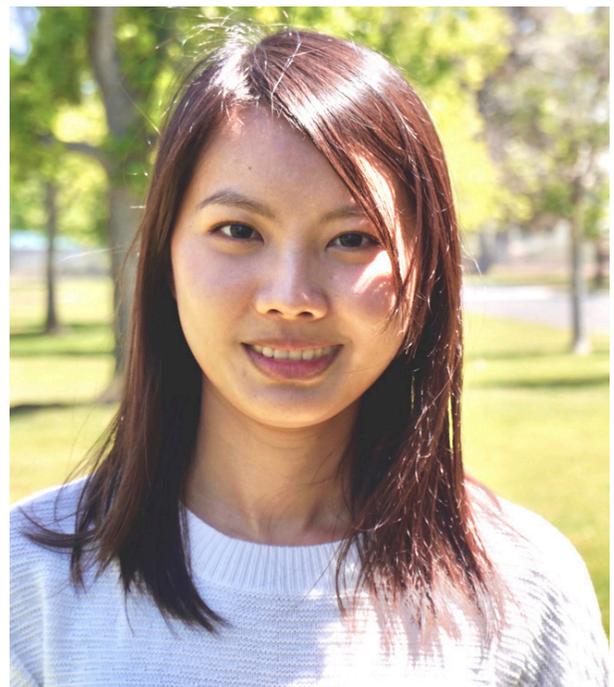
Concluding remarks

LFA remains a serious invasive pest in Hawai'i, and early detection is essential for reducing spread and impacts. In our food preference tests, LFA workers most strongly preferred cooked beef and sunflower seeds (protein-lipid), honey (carbohydrate), and peanut butter oil (lipid). Using more attractive lures or baits can improve survey sensitivity, provide alternative food options, and help residents and field teams make better-informed management decisions.

The article is based on Shrestha, A., Bhetwal, N., Khadka, B., & Tay, J.-W. (2026). Food Preference Analysis of the Little Fire Ant, *Wasmannia auropunctata*, in Hawai'i currently accepted in the Journal of Applied Entomology. Please refer to the published online version when it is available for the complete report, including full methods, figures, and supporting data.

About the author

Dr. Jia-Wei Tay is an Assistant Professor in urban entomology in the Department of Plant and Environmental Protection Sciences, CTAHR, University of Hawai'i at Mānoa. Her research focuses on the biology, behaviors, and management of invasive species, especially insect pests adapted to the urban environment, using IPM strategies. She teaches Medical and Urban Entomology (PEPS 463) in Fall semesters.



Community Engagement on Maui



Heat Management Workshop organized by Rosemary Gutierrez-Coarite at the Kula Ag Park on December 4, 2025.



At the listening session with Congresswoman Jill Tokuda at the Kula Ag Park, organized by the Maui County Farm Bureau on January 27, 2026 (top two and bottom left), and at the Maui High School on February 19, 2026 (bottom right).



SUMMER RESEARCH INSTITUTE



Location

Hawai'i, Kaua'i, O'ahu, Maui, Moloka'i

Program Duration

Jun 8, 2026 - Aug 1, 2026

Eligibility and Program Requirements

- Rising high school juniors to college undergraduates (open to all UH campuses)
- Minimum Grade Point Average of 2.80 (transcript required)
- Submit a short application by **April 3** (priority deadline)
- Minimum 25 hours per week, flexible schedule agreeable to student and faculty mentor

Objective

Inspiring and empowering high school and undergraduate students to build solutions to local and global problems through agriculture, environment, food, fashion, family, and community-based science research projects

Activities

- Engage in field, lab, and/or library-based research at sites in **Mānoa, Waimānalo, Wahiawā, Pearl City, Kona, Hilo, Kapa'a, Kula, Kahului, or Ho'olehua** for 25 hours each week
- Weekly professional development workshops
- Research proposal and paper writing
- Data analysis and interpretation
- Poster preparation and presentation at the CTAHR symposium on **July 24**

Benefits

- Earn **3 college credits**
- Learn research skills and the scientific process
- Build critical thinking and problem-solving skills while tackling real-world issues
- Aloha 'āina foundations
- Build connections with other students and researchers
- Opportunity to use the research project for state, national or international competitions with permission from the faculty mentor
- Enhance communication and presentation skills
- Boost your credentials for college applications and jobs
- Opportunity to compete for a student/faculty team research award
- Earn a **Certificate of Completion** by fulfilling all program requirements

How to Apply

go.hawaii.edu/8Q8



UNIVERSITY of HAWAII at MĀNOA

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