

Self-Guided Tour of the UCSC Farm

Center for Agroecology

University of California, Santa Cruz



UC Santa Cruz Land Acknowledgement

The land on which we gather is the unceded territory of the Awas-speaking Uypi Tribe. The Amah Mutsun Tribal Band, comprised of the descendants of indigenous people taken to missions Santa Cruz and San Juan Bautista during Spanish colonization of the Central Coast, is today working hard to restore traditional stewardship practices on these lands and heal from historical trauma.

What is a land acknowledgement?

A land acknowledgement is a statement that recognizes the history and presence of Indigenous peoples and their enduring relationship to their traditional homelands. Land acknowledgements help create awareness of the cultural erasure of Indigenous peoples and the processes of colonization and subjugation that have contributed to that erasure. As current stewards of the UCSC Farm and Chadwick Garden, the Center for Agroecology is committed to uplifting and supporting the Amah Mutsun Tribal Band and Land Trust. Learn more about the Amah Mutsun Tribal Band at <https://amahmutsun.org/>.

Welcome to the UC Santa Cruz Farm!

The Farm serves as an outdoor classroom and research site and is managed by the Center for Agroecology, an organization that works to advance agroecology and equitable food systems through experiential education, participatory research, agricultural extension, and public service. Learn more about the Center at <https://agroecology.ucsc.edu>.

A Few Guidelines While You Walk

- Please stay on the paths. Garden beds are carefully cultivated to provide proper aeration and drainage for plants – stepping on the beds compacts the soil.
- Please don't harvest anything. The vegetables, fruit and flowers grown here are donated to student food security programs on campus or sold to the community with proceeds supporting our education programs and the facilities.
- You need not confine your visit to the tour stops. Feel free to wander where your interests lead you, except for residential areas (the tent cabins and Farm Center), the Agroecology Laboratory and Soil Laboratory, and the equipment barns. These areas are closed to visitors unless other arrangements have been made.
- The tour is approximately one half-mile long and portions of it can be damp in the winter and spring or when we are irrigating – be prepared to get your shoes muddy during those times. Please also be mindful of gopher holes and other uneven terrain. Comfortable walking shoes will make your visit more enjoyable.

- A public restroom is located on the south (ocean-facing) side of the Louise Cain Gatehouse, the wood and stone structure just inside the Farm's "Gatehouse entrance."
- Requests for accommodations can be made by emailing agroecology@ucsc.edu. We will do our best to accommodate requests.

About the Farm

The Farm's Beginnings

UC Santa Cruz students working with English gardening expert Alan Chadwick founded the Farm in 1971. Chadwick began the Student Garden (now the Alan Chadwick Garden, located on upper campus) in 1967; there he practiced "French intensive" organic gardening techniques, in which crops are planted close together to maximize yields from small plots of land, that have since been widely adopted by both home gardeners and commercial growers. Chadwick combined these methods with organic practices such as recycling garden nutrients through composting, building soil with organic fertilizers, and encouraging biological pest control in the garden by growing a diversity of plants. The Farm was created as an experiment in translating these and other organic management techniques from a garden to a larger-scale setting.

Certified Organic by CCOF

The UCSC Farm is certified organic by California Certified Organic Farmers (CCOF), an independent certification group that ensures agricultural practices adhere to rules established by the U.S. Department of Agriculture's National Organic Program. In addition to our organic management techniques, we make a conscious effort to plant a diversity of plants to promote a healthy agroecosystem.

A Place for Learning

The UCSC Farm is a unique site for developing and demonstrating sustainable practices and agroecological principles that maintain soil fertility and crop yields while protecting natural resources. UCSC staff, faculty and students use the Farm as an outdoor classroom for undergraduate courses and research projects. Children, high school students, and educators also engage with the Farm through tours, camps, and teacher training workshops offered by Life Lab, a nonprofit organization that cultivates children's love of learning, healthy food, and nature through garden-based education, and the youth empowerment and food justice-focused "Food, What?!" program. Public gardening workshops, community events, and group tours take place at the Farm throughout the year, and apprentices live and learn at the Farm during the growing season.

The self-guided tour begins at the Visitor Information Area (see map on front page).

Visitor Information Area

Learn more about the Farm and activities of the UC Santa Cruz Center for Agroecology, as well as past and current Indigenous stewardship of the land on which the UCSC Farm sits.

Perennial Border

This border of flowers and shrubs features perennials, plants that grow and flower year after year. Using a mix of perennials that bloom in different seasons, gardeners can create year-round displays of colors, scents, and textures that require minimal maintenance once they're established. Here we chose plants both for their aesthetic qualities of beauty, fragrance, and form, as well as their use as cut flowers (both fresh and dried). As with most perennial plantings in this climate, much of the border's maintenance takes place in late winter, when plants are pruned and fertilized with compost.

The path between the vegetable shed and the perennial border leads to the main garden.

Main Farm Garden

This vegetable, herb, and flower garden measures 200 by 350 feet with the beds oriented north-south for maximum sun exposure. The native soil is sandy loam with average fertility and drainage qualities. Here in the garden, students learn market garden production skills including soil care, bed preparation, irrigation, and pest control as they plant, care for, and harvest a wide variety of crops. Some of the gardening techniques used here include:

Double-Dug Beds – Compare the loose, aerated soil of the beds to the compacted soil of the paths. Reach down and feel a bed's light, crumbly soil texture. Gardeners created this plant-friendly environment by initially double digging the bed (see diagram at right) and adding compost that will nourish soil organisms and release nutrients throughout the growing season. Once beds have been double dug they can be maintained by "deep forking," loosening the top layer to the depth of a digging fork's tines and adding compost each year. We also plant a cover crop in the winter to protect the soil from erosion. This garden's system of permanent beds and paths produces abundant yields year after year.

High-Density Planting – The rich soil conditions created by double digging and adding compost can support a high density of plants. In many

beds, seedlings are spaced so that the leaves of the mature plants will touch those of adjacent plants. The canopy they create reduces evaporation and inhibits weed growth.

Intercropping – Another way to increase yield in a limited space is to grow several different crops in the same bed. This planting strategy requires careful planning, so that all the plants' needs are met. For example, shade tolerant vegetables, such as lettuce and radishes, can be grown beneath trellised cucumbers or peas, which prefer full sun.

Diverse Plantings – In natural ecosystems, many different plants and animals live together, each with its own ecological "niche." This diversity helps maintain a balance of predators and prey, and inhibits the outbreak of pests and diseases. The garden mimics nature's diversity by including many different types of vegetables, fruits, flowers, and herbs. Many of these plants provide habitat for birds and beneficial insects – insects that prey on or parasitize plant pests. In contrast, large areas planted with only one type of crop, known as monocrops, can be a magnet for pests but often support fewer beneficial insects.

Continue to the Community Herb Garden and Black Lives Matter Garden in the Farm Garden.

Community Herb Garden

The Community Herb Garden in its current form was created by students under the direction of Center for Agroecology staff member Kellee Matsushita-Tseng in 2021-2022. The medicinal plants in the garden are organized by which parts of the body they affect: lemongrass and Tulsi basil in a plot for the lungs, Epazote and Chamomile for the digestive system, etc. Beds are laid out roughly where body parts would be, with plants affecting the head at the north end and plants affecting the feet at the south end of the garden. The intention of the space is to connect historically oppressed Black, Indigenous, and people of color (BIPOC) students and community members to the land through their own cultural heritage with traditional plants used for food, medicine, and spiritual practices.

Black Lives Matter Garden

The Black Live Matter Garden was founded in 2015 by second-year apprentice Leo Orleans. In 2016, the BLM Garden was moved to its current location. In the words of Leo, "The BLM garden is an honoring of and place to convene with all of our relatives lost to state and systemic violence and to gather together to set forth intentional movement around building love, joy, and solidarity with all our relatives who are still in struggle towards a sovereign future of true, collective, and self-deter-

mined Liberation.” By these means and through the prioritization of Black leadership, the BLM Garden has been carried forward under the stewardship of the Farmers of the Global Majority (a collective of BIPOC Center for Agroecology alumni) and BIPOC community members and student leaders.

The Black Lives Matter Garden contains a central altar space, beds in the four directions, and the mural, “We Didn’t Cross the Border,” painted by Emilia Cordero. It continues to evolve each year, shaped by the learning interests of those who are stewarding it each season.

The tour continues to the back of the garden.

Compost Row

This area has traditionally been used for compost piles. You can think of the compost piles as a combination recycling center/fertilizer factory. Inside the piles, bacteria, fungi, and insects are at work breaking down layers of weeds, cover crops, straw, and stable bedding (horse manure mixed with straw). Temperatures rise to as high as 160°F within the piles as the bacteria and other organisms breathe and move around, generating heat that destroys harmful microorganisms and weed seeds. The decomposition process can be accelerated by turning and watering the piles to keep them aerated and moist. The end result of the composting process is a dark brown, earthy-smelling humus that looks like rich, crumbly soil. When added to the garden beds, finished compost replenishes nutrients and organic matter removed when crops are harvested. Humus also improves soil structure and creates a spongy texture that helps hold moisture in the soil.

Bordering this area on either side of the path are hedgerows of fruit trees, alder and locust trees, and various shrubs. These plants shelter the main garden from westerly winds and protect the compost from wind and sun. Through their roots, the hedgerow plants take up nutrients leached from the compost piles by the rain, and return these nutrients in the fall in the form of fallen leaves. The hedgerow’s trees and shrubs also attract beneficial insects and pollinators.

Blueberries

Fifteen varieties of blueberries were planted in 2004 as part of a trial to identify varieties that do well in our climate without the use of synthetic pesticides or fertilizers. Varieties ‘Southmoon,’ ‘Jubilee,’ ‘Jewel,’ and ‘Millenia’ have performed especially well, although staff note that keeping the soil acidity level high enough for blueberries to thrive – and protecting the plants from birds – can pose challenges. Prior to planting the

trial, Farm staff amended the soil with sulfur to raise its acidity. Each year plants are top-dressed with wood chips, compost, and sulfur to lower soil pH and maintain fertility. During the growing season vinegar is applied through the irrigation system to keep the soil's pH level (a measure of its acidity) at approximately 4.5.

To see the row crops, walk back past the hedgerow and turn right.

Field Crops

The row crop fields and other fields and orchards surrounding this site supply our Community Supported Agriculture project along with our produce stand and distribution to campus food pantries and produce outlets. Many of the crops grown here are planted in a carefully-timed sequence to provide successive harvests all year long.

Depending on the season, crops may include broccoli, bush beans, salad greens, summer and winter squashes, corn, onions, garlic, peppers, tomatoes, and potatoes. Farm managers use a small tractor to prepare the fields and to plant and cultivate the row crops, supplemented by hand labor. This area of the Farm demonstrates the way organic practices can work on a scale larger than that of the hand-worked garden beds. To maintain soil fertility and limit erosion from winter rains, cover crops such as bell beans, rye, and vetch are planted after the fall harvest.

Each year, Farm staff members also take a portion of the fields out of normal summer production (a practice known as fallowing) and plant a summer cover crop such as cereal rye, annual buckwheat, or sorghum-sudangrass in order to build soil organic matter and prevent loss of organic matter from a "dry fallow" in the summer sun. Preserving and protecting organic matter is a foundation of the farm's fertility management plan. Crops are also "rotated" from place to place in the fields so that the same crop isn't grown in the same area year after year. This practice of crop rotation helps limit pest and disease outbreaks.

Herbicides account for more than two-thirds of the chemical pesticides used in farming operations each year; controlling weeds without herbicides can be a challenge for organic growers. Here, timely, careful cultivation using various implements pulled behind a small tractor saves hours of hand hoeing. This type of weed control can be adapted to a variety of row crops. Drip irrigation also limits weed growth, and crop rotations are designed to help break cycles of perennial weed growth.

Beyond the fields and orchards grows a row of dark green trees. These are Monterey cypresses, planted to protect the row crops from wind

damage. Windbreaks and other perennial plantings provide food, fuel, erosion control, and wildlife habitat – they play an important role in a diverse farm ecosystem.

Research on the Farm

Portions of the Farm's fields, gardens, and orchards are used for research projects and agroecology class experiments. Over the years, Center researchers, UCSC faculty affiliates, cooperating scientists, and students have investigated a variety of topics, including:

Soil fertility and nutrient management – One of a farmer's biggest challenges is to maintain a balance of nutrients in the soil – providing enough so plants will thrive, but avoiding an excess that can pollute waterways and wells. Studies at the Farm have included research on the impacts of different types and levels of organic fertilizers and cover cropping systems on soil and crop nutrient levels and yields. Other research has monitored nutrient levels in rain and irrigation water as it moves through the cropping system to determine the amount of nutrients being leached from the soil.

Intercropping – Growing more than one type of crop in the same plot, or growing crop and non-crop plants together may limit pest problems and in some cases increase yield from each crop. Class experiments and other studies examine the differences between monocropped and intercropped plots to see whether intercropping might hold promise for growers interested in these systems.

Cover Crops and Crop Rotations – Cover crops can boost soil fertility, protect the soil from erosion, and improve soil conditions, such as particle size and structure, for crop growth. Studies conducted on the Farm examine the effect of various cover crop types and strategies.

Variety Trials – One way to limit pesticide inputs is to identify crop varieties that are naturally resistant to pest damage. Center members conduct variety trials to pinpoint those crops that perform best in systems in which no synthetic pesticides or fertilizers are used, that do well in the Central Coast climate, and that appeal to consumers.

Tent Cabins (private)

To the northwest of the apple orchard you can see a set of nine wooden tent cabins. Built in 2010 with support from grants, foundations, and many generous donors, the tent cabins house participants in our Apprenticeship Program in organic farming and gardening. (Please note that the tent cabins are not open to the public.)

Orchard

One can find fruit trees throughout the Farm: citrus north of the Farm Garden, apple and pear trees within the hedgerows, avocados, pears and some of the first plums planted in the 1970s. There are now more than 80 varieties of apples as well as more than 30 varieties of citrus at the Farm and Alan Chadwick Garden sites. In the fall, Farm staff plant a cover crop between the tree rows to prevent erosion and provide a source of nitrogen and organic matter. Pruning is said to be an art. Dead wood goes, but deciding what live branches and shoots to cut requires an educated and discerning eye. Each variety and genus of tree has particular requirements.

Two types of pruning are used at the Farm. Each method allows maximum sun and light to penetrate the center of the tree.

A. Modified central leader—Trees pruned by this method have a main trunk with up to five branches per whorl off the main trunk. As the tree grows taller, pruning will develop three or more horizontal branch whorls. Trees pruned in this manner grow upright and can be planted closer together than the vase-shaped trees.

B. Vase-shape—This method makes an open-centered tree. There is no main trunk. Inside tree branches grow outward and each branch branches again. This style is used on the largest percentage of trees here.

Hoop Houses

These hoop houses, also known as ag tunnels, allow for year-round crop production. The greenhouse-like structures help protect plants from the elements, enabling us to provide a year-round supply of fresh, low-cost produce to campus dining halls, food pantries, and market pop-ups at UC Santa Cruz, especially during cold and rainy winters when choices are limited. Every year, the UCSC Farm produces over 20,000 pounds of produce for students and the community.

Aquaculture Greenhouse

Dr. Anne Kapuscinski, professor of Environmental Studies at UC Santa Cruz and director of UCSC's Coastal Science and Policy Program, and Dr. Pallab Sarker, associate research professor of Environmental Studies at UC Santa Cruz, are researching how to raise food fish using sustainable aquaculture-agriculture practices.

At this research facility, the team is focusing on shifting the feed used in aquaculture from fishmeal and fish oil extracted from wild fish pop-

ulations to a sustainably produced, microalgae-based feed free of fish products, as well as reducing the phosphorus load in water compared to conventional aquaculture practices. Researchers will also explore the potential of raising native freshwater fish, such as rainbow trout and Sacramento perch and will integrate aquaculture with agriculture at the UCSC Farm by examining ways that nutrient-rich water periodically flushed from the recirculating fish tanks can be used on crops in order to “close the loop” of nutrient use, reduce waste, and conserve energy.

Farm Center (private)

Students helped design and build the Farm Center in 1974 as part of a class project. The building serves as a meeting place, kitchen, and dining hall for apprentices, students, and staff.

Agroecology Laboratory

Classes based at the Farm use the laboratory for lectures and lab sessions. Across from the agroecology lab is the soil lab, where soil and root samples are processed for analysis. (Reminder: The lab buildings are not generally open to visitors.)

Surrounding the lab building is a border of California native plant species. Among them are black sage, California bush anemone, coast silk tassel, California flannel bush, pitcher sage, and Western sword fern. These plants require less water and are less vulnerable to pests and diseases than many of the non-native species often used in landscaping.

Lath House

The lathhouse serves as a place to store soil mixes, sow seeds, transplant/pot up seedlings and other propagation related tasks. We are currently using a soil mix based on composted forest products, and peat moss, with nutrients derived from a granular organic fertilizer. We also blend in a beneficial *Trichoderma* fungus into the mix to promote plant health and help suppress damping off fungi. When the need arises, we will also apply water soluble nutrients to seedlings, using ingredients such as fish emulsion, kelp extract and soy proteins.

Solar Greenhouses

Many of the Farm’s seedlings are raised here, where the warmth promotes germination and development. Once they are more mature, most seedlings are moved to outdoor tables where they can adjust to outdoor conditions (a process called “hardening off”) before being planted in the gardens and fields.

These greenhouses use a passive solar energy system, capturing sunlight for heating rather than using gas or electricity (some power is used to open and close the automatic vents and run fans). Farm staff and students monitor temperatures inside the greenhouses each day. To prevent plants from overheating in warm months they place shade cloth over the plants. Vents also promote air flow as cool air enters through the lower vents and exits through the upper vents, creating circulation even when the greenhouse doors are closed.

Unlike most commercial greenhouse operations that rely on synthetic chemical pesticides and fertilizers, Farm staff use organic techniques such as “sticky traps” to control fungus gnats, whiteflies and other pests, and compost “tea” or fish emulsion to promote seedling growth.

Life Lab, the Garden Classroom, and FoodWhat?!

The Life Lab Garden Classroom serves as a model school garden and learning center for teachers and students. It was created by Life Lab, a non-profit organization that cultivates children’s love of learning, healthy food, and nature through garden-based education. Life Lab programs use the gardens, farm fields, orchards, and outdoor kitchen as “living laboratories” where students learn about topics ranging from basic botany, soil structure, and the importance of pollinators, to the connection between their food choices and their health. The Garden Classroom hosts a year-round schedule of school tours, day camps, teacher training workshops, youth programs, and community events. Here you can explore compost piles and worm composting in the “Rot Zone,” view bees at work at the observation hive, follow the “track trail,” and visit the plant petting zoo.

The youth empowerment and food justice-focused “Food, What?!” program serves Santa Cruz County high school students through internships, summer jobs, and community events. Staff members partner with local teens to grow, cook, eat and distribute healthy, organic food to the community. Along with learning how to grow crops, “Food, What?!” students develop critical life, leadership, and job skills through this award-winning program.

Louise Cain Gatehouse

To the left of the Farm’s east entrance is the Louise Cain Gatehouse, which serves as a classroom and meeting space. The Gatehouse, a reconstruction of the Farm’s first building, is named in honor of Louise Cain, a long-time champion of the Farm and the Apprenticeship Program, and a founding member of the Friends of the UCSC Farm & Garden, a group of volunteers that provides support for the Farm, Chadwick Garden, and Center for Agroecology.

Hay Barn & Quarry Fields

Beyond the fence near the Gatehouse lie 2.5 acres of cropland dubbed the “Hay Barn Field.” This field was added to the Farm’s original 25 acres in the fall of 2012, along with the 3-acre Quarry Field, which borders Hagar Drive. These fields are used for teaching, research, and growing crops for students.

Cowell Ranch Hay Barn

Just below the south entrance of the Farm sits the Cowell Ranch Hay Barn, built in the late 1860s to store hay and manage livestock used in the extraction of timber and limestone by the Cowell Lime Works operation. The Hay Barn was completely deconstructed and rebuilt between 2013 and 2016. The renovated Hay Barn now serves as administrative quarters for the Center and a community event space.

This concludes the self-guided tour of the Farm. Thank you for visiting!

Visitors are also welcome at the Alan Chadwick Garden, located next to Merrill College on upper campus. The garden is open daily from 8am to 6pm.

To learn more about the Farm, Garden, and the other sites, activities, and programs of the UC Santa Cruz Center for Agroecology, visit <https://agroecology.ucsc.edu>.