



News & Notes of the UCSC Farm & Garden

Issue 160, Spring 2019

NO-TILL STUDY UNDERWAY AT THE UC SANTA CRUZ FARM

This spring a patchwork quilt of research plots will emerge at the UCSC Farm, as research lands manager Darryl Wong launches a 3-year field trial to study the effect of no-till and reduced tillage farming practices on organic crop production and soil carbon levels. More specifically, he's interested in finding out whether no-till organic vegetable systems can produce comparable yields to tilled systems while at the same time improving soil health and sequestering carbon in the soil.

Tillage defined

"Tillage" is a general term for turning the soil to prepare planting beds using tractor-draw implements, resulting in the familiar sight of fields striped with rows of crops, alternating with rows of bare soil. No-till, sometimes used under the umbrella term "conservation tillage," eliminates the mechanical tillage process. Instead, no-till systems leave a layer of vegetation — usually a "knocked down" or "winter killed" cover crop — on the soil surface, which acts as a thick mulch. A specialized "no-till" planter is then used to cut a narrow strip through the mulch, dropping seeds or transplants in the soil furrow, but otherwise leaving the soil undisturbed.

Why no till?

No-till systems address a number of issues facing agriculture. By turning the soil and incorporating crop or cover crop residues, typical tillage systems improve short-term productivity by introducing oxygen, which increases soil microbial activity, improves fertility, raises soil temperatures, and reduces weed competition. The drawback to intensive tillage is that organic matter in the soil breaks down more quickly, releasing carbon dioxide into the atmosphere. Tillage can also increase erosion and negatively impact soil fungal populations and earthworm habitat. Tillage also disrupts the soil "clumps," or aggregates, that create good soil structure.

Undisturbed by tillage, decomposing cover crops and roots can boost organic matter levels in the soil. In no-till systems the soil's microbial communities and earthworm populations can flourish, soil structure is preserved, water infiltrates more readily, and soils better retain moisture. In addition, carbon stays in the soil, sequestered in soil organic matter—although research shows carbon levels may only be higher in the top few inches of soil in no-till systems.

No-till can also decrease the cost of inputs, including fuel, fertilizers, and equipment. Instead of running tractors across a field 15 or more times to prepare beds and manage weeds, no-till may only require 2 or 3 tractor passes in a season, as well as less energy to pump irrigation water. Less fuel and energy use translates to lower costs and fewer carbon emissions.

No-till's challenges

No-till agriculture has been adapted on a large scale by many conventional growers, particularly on the Midwest and Northeast's corn, soybean, and grain farms, as well as in similar cropping systems in Brazil, Argentina, and Canada. So if no-till has so many advantages, why aren't more organic farmers using it?

Part of the answer lies with weeds and seeds: most no-till systems rely on synthetic chemical herbicides, often Roundup, to kill cover crops prior to planting and control weeds once the crop is growing. Farmers pair herbicides with genetically modified (GMO) corn and soybean seeds designed to withstand chemical sprays, so that the crops aren't damaged by the weed killers. Without these tools in their toolbox, organic growers face more hurdles in successfully adapting no-till methods.

One answer has been an implement called a "roller crimper" that organic farmers in some parts of the country have used successfully to "knock down" and chop up cover crops. A seeder drawn behind the tractor then parts the mat of cover crops and drops in seeds.

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For a number of reasons, the roller crimper hasn't worked for California farming systems. In part, it's economics: California's farmers pay the highest land prices in the country. High costs mean that growers are under pressure to produce two, three, or more high-value crops a year. Crops such as corn and soybeans that perform well in no-till systems don't generate enough income compared to specialty vegetable and fruit crops. And because California land values are so high, it's often not practical to delay planting while waiting for a cover crop to mature to the point that a roller crimper system can be used.

Pest populations can also build up in fields mulched with cover crops, creating challenges that organic growers have a harder time controlling. And cover crops left to develop into the spring draw precious moisture from the soil, leaving less in reserve for the crop that follows. This can increase the need for irrigation once the crop is planted, which can be a problem in a state subject to periodic drought.

Soil temperature also comes into play. The heavy mulch of no-till systems cools the soil, which slows the release of soil nutrients from organic inputs such as compost or other fertility sources, thus slowing crop development. And because many of the crops produced here—including carrots, lettuce, beets, kale, and brassicas—grow from small seeds, the seedlings may have trouble pushing through a thick mulch of cover crops left on the soil surface.

Study compares three tillage approaches

All of these challenges factor into the field trial that Darryl Wong is starting this year on a quarter-acre plot at the UCSC Farm. The research is part of Wong's graduate work in Environmental Studies, supported by a grant from the Gordon Family Foundation.

His approach to the study is based in part on what other farmers in the area have done in trying to incorporate no-till systems into their practices. "There have been a lot of attempts by growers in the region to make no-till work," says Wong. "This study provides a chance to experiment with different approaches, and try to learn how best to adapt and modify the technique for conditions on the Central Coast."

To address the issue of weed control, he's planted a winter cover crop of mustard. As it grows and decomposes, mustard releases plant chemicals that suppress weed growth through a process known as allelopathy. Mustard also flowers in late winter and can be "mow killed" in early spring, using a flail mower to chop up the mustard and leave it on the soil surface. This timing works well with the vegetable cropping systems used at the UCSC Farm.

After mowing the mustard this month, Wong will open a narrow strip in the resulting mulch and plant Romaine lettuce. Following the Romaine crop, he'll plant



CASFS Farm & Garden Apprenticeship grad Mike Nolan using a roller-crimper on his organic farm in Colorado, where he is conducting a no-till study funded by the Western Sustainable Agriculture Research and Education program. Read more at – mountainrootsproduce.com/farmblog/2018/12/10/western-sare-project-crimping-and-strip-tilling

a summer cover crop of buckwheat, which grows quickly and suppresses weeds. He'll then mow-kill the buckwheat and plant a crop of broccoli into the decomposing surface mulch. After the broccoli harvest, the plots will again be planted with mustard in late fall, starting the cycle again.

Regional growers are also interested in whether a "reduced tillage" system might produce some of the same soil health and potential carbon-capturing benefits of no till, but with better weed control. Wong will use a "shallow tillage" technique on some of the study plots to test this theory, tilling to just 3–6" deep prior to planting and, once the crops are established, to manage weeds.

Crop yield and soil carbon levels in the no-till and reduced-tillage systems will be compared to those of the "standard" tillage system used at the farm. This system includes a deeper tillage pass (6–12") with a spader to incorporate the cover crop prior to planting, followed by additional passes with a cultivator to prepare beds and control weeds. In addition, he'll evaluate the amount of labor and fuel used by each system, to see whether no-till and reduced tillage saves time and resources.

In assessing changes in soil carbon levels, Wong measured carbon at three different depths prior to planting this winter's cover crops to establish a baseline, and will measure it again at the end of the trial period. He will also measure how much carbon is contributed by the cover crop's roots and other inputs, such as compost.

You can see this new research project in action next time you visit the UCSC Farm, and read more about it on the Center for Agroecology & Sustainable Food Systems website, casfs.ucsc.edu (click on the Research heading), where we'll post periodic updates.

– Martha Brown

Spring 2019 Calendar of Events

2019 CSA: Sign up by May 1 for 5% Discount

See details on page 4

Docent-Led Tour of the UCSC Farm

Sunday, May 5, 2:00 pm – 3:30 pm

Hay Barn, UCSC

Join us for a guided tour of one of Santa Cruz's most beautiful locations—the 30-acre organic farm at UC Santa Cruz. Tours meet at the Hay Barn, adjacent to the UCSC Farm. Free parking available at the Hay Barn.

Farming While Black, Author's Talk

Friday, May 10, 3:00 p.m. – 5:00 p.m.

Hay Barn, UCSC

At this free talk, author Leah Penniman discusses the history of Black farmers and their contributions to agriculture, traditional farming knowledge, and foodways as described in her book *Farming While Black: Soul Fire Farm's Practical Guide to Living on the Land*.

Grain by Grain, Author's Talk

Tuesday, May 14, 6:00 p.m. – 7:30 p.m.

Hay Barn, UCSC

Join organic farmer Bob Quinn and Stanford Lecturer Liz Carlisle for a free talk highlighting their new book, *Grain by Grain: A Quest to Revive Ancient Wheat, Rural Jobs, and Healthy Food*. Drawing on Bob's 30-year journey in regenerative organic agriculture and renewable energy, they will discuss how transformation of regional food systems can drive big changes over time: creating good green jobs that rebuild rural communities, while providing healthier food and better environmental stewardship.

An Introduction to Garden Herbalism

Saturday, May 18, 9:30 a.m. – 12:00 p.m.

UCSC Farm

The fields and gardens of the UCSC Farm abound with medicinal plants. Join Darren Huckle, owner of Roots of Wellness, and learn how to use common medicinal plants for everyday maladies and health promotion. Find more details and pre-register online at herbwalk2019.bpt.me

Spring Plant Sale Update

Please note that we will not be holding the Spring Plant Sale this year so that the UCSC Farm & Garden staff can focus on other programmatic needs. We encourage you to support the many other sales in the region this spring, and look forward to bringing you the Farm & Garden's Spring Plant Sale in 2020.

Summer Fruit Tree Care

Saturday, June 1, 9:30 am - 12:30 pm

UCSC Farm

Summer fruit tree care is more than about pruning — proper irrigation, feeding, and pest control, combined with a summer pruning plan, are the best ways to ensure the health and productivity of your fruit trees.

Learn about summer fruit tree care from Orin Martin, manager of the Alan Chadwick Garden at UC Santa Cruz. Wear comfortable shoes and bring a snack. Find more details and register online at fruitsummer.bpt.me

Opening Day of Market Cart

Friday, June 7, 12 noon – 6:00 pm

Corner of Bay & High Streets

The 2019 Market Cart season opens today (weather permitting). Enjoy fresh organic vegetables, fruit, and flower bouquets grown at the UCSC Farm & Garden. EBT, cash, and checks accepted. Market Cart takes place every Friday through late October.

A Garden of Poetry and Music

Saturday, June 8, 12 noon – 2:30 pm

Alan Chadwick Garden, UCSC

Join us in the historic Alan Chadwick Garden for an afternoon of poetry and music (free event). This is one of our favorite events of the year, featuring a bevy of talented regional poets and musicians, including Danu-sha Lamaris, Maggie Paul, Pireeni Sundaralingam, and David Robles. This year we're adding a silent auction to the day's event.

If you'd like more information about these and other events, need directions, or have questions about access, please call 831.459-3240, email casfs@ucsc.edu, or see our web site, casfs.ucsc.edu

Sponsored by the UCSC Center for Agroecology & Sustainable Food Systems (CASFS), and the Friends of the UCSC Farm & Garden

Get Your Share in the 2019 CSA Program! Sign up by May 1 and get a 5% discount

Be a part of the UCSC Farm's Community Supported Agriculture (CSA) project and support your local farm! The CSA program runs for 21 weeks, scheduled to start this year on June 4 (actual start date is weather dependent). Boxes include same-day harvest of a wide range of vegetables and fruits, including strawberries and blueberries, plums, apples, and pears. Pick up your share at the UCSC Farm on Tuesdays and enjoy the pick-your-own herb and flower garden adjacent to the pick-up site.

Shares for the 2019 season cost \$540, and include 8–12 items per week. Payment can be made in full, or divided up into two, four, or six installments. Ten-week "Peak Season" shares starting August 20 are available for \$257, and the CSA accepts SNAP/EBT benefits. Flower shares are also available for \$10 per week. More information and a link to the CSA Pledge Form can be found at: casfs.ucsc.edu (see Produce Sales - CSA under the Community link).

If you'd like us to send you a CSA Pledge Form or have any questions, please contact Vanessa Ackerman at 831.459-3240 or email casfs@ucsc.edu.

IS IT TIME TO RENEW?

Check your wallet—do you still have your Friends of the Farm & Garden membership card? Is the expiration date before 5/1/2019?

Renew your relationship with the Farm & Garden to use the excellent perks your membership provides. Besides supporting all the good work that happens at the UCSC Farm & Garden, you can –

- Shop at San Lorenzo Garden Center and The Garden Company in Santa Cruz, and Sierra Azul in Watsonville, and show your card to get 10% off any plant purchase. This could be significant savings for you avid gardeners!
- Take one of our workshops at \$5–10 off the regular price. Just a few workshops and your membership is paid for!
- Get free admission to the Fall Harvest Festival which is a big hit with kids and adults alike.
- Receive advance notice of every event plus special events just for members.

Your membership dollars go to support the UCSC Farm & Garden, the Apprenticeship in Ecological Horticulture, as well as other CASFS educational and research programs that make the world a better place.

Take a minute now to renew your membership online at our secure giving site: connect.ucsc.edu/joinffg, or see casfs.ucsc.edu/about/support-casfs for a form you can download and mail to us. Thank you!

Thanks to our Supporters!

Grants Fund Translation of Grower Guides into Spanish

Soon all nine of our new Grower Guides will be available for free in Spanish and English, thanks to grants from the Nell Newman Foundation, Inc. and from the Farmers Advocating For Organics (FAFO) grant program of Organic Valley/CROPP Cooperative. Grants of \$6,000 from each foundation will pay for the translation of the guides along with their dissemination for free in print and online.

The Grower Guides were developed initially as part of a California Department of Food & Agriculture Specialty Crop Block Grant. The nine Grower Guides feature specific crops grown using organic and sustainable production practices at the CASFS farm, with distinct blocks of mixed vegetables and cut flowers providing data for the publications covering varietal choices, production practices, and economic analysis. Several of the guides have been translated so far and are posted with their English counterparts in the publications section of the CASFS website (casfs.ucsc.edu/about/publications). The new Spanish Grower Guides will be added as their translations are completed.

UCSC Giving Day Donations Help Grow Food for Students in Need

The \$4,425 raised on UCSC Giving Day will go a long way toward helping to grow organic produce for UCSC students in need. According to a 2016 University of California study, 57 percent of UCSC students reported skipping meals or eating less because of financial strain. High rents and other costs are making it hard for students to afford food. Organic produce grown at the UCSC Farm is now serving students at the Slug Support Pantry and other campus food pantries and at the Cowell Coffee Shop. We are grateful for the Giving Day contributions that will be used for seeds, farm equipment, student farm staff, and other expenses that go into growing organic produce for students in need.

We Lose a Good Friend

We were saddened by the sudden passing of Nellie Yung-Weeks, one of the Farm & Garden's long-time volunteer docents and community supported agriculture (CSA) project members.

Nellie's family held a beautiful celebration of her life at the Cowell Ranch Hay Barn and shared a number of her favorite sayings, including "Save room for conversation," and "Live with an open heart." She will be greatly missed.

Spring Tasks in the Garden & Orchard

“Behold, my friend, the spring is come; the earth has gladly received the embraces of the sun and we shall soon see the results of their love!”

- Sitting Bull

With the weather warming up and soil drying out, it’s time to finish (or start!) the many spring garden and orchard tasks clamoring for attention. Here are some tips from Christof Bernau, who manages the hand-worked gardens at the UCSC Farm.

Trees and Other Perennials

Finish up any winter pruning of fruit trees, blueberries, and other perennials. Even if you shear off a little new growth, or are pruning laterals in flower on your fruit trees, it’s better to prune now and establish the shape that you want.

Feed your perennials with compost and targeted fertilizers if soil testing or your observations of plant health indicates the need. For citrus, avocados, azaleas, and rhododendrons, look for organic granular fertilizers specific to those plants, available at your local nursery, and give these plants a nutrient boost.

Fruit trees and other perennials will also benefit from a heavy top dressing of wood chips around the base of the plants. The thick mulch will not only help keep down weeds and conserve soil moisture, it will increase soil organic matter and also stimulate microbial activity in the soil as it decomposes, thus liberating nutrients for crop use.

It will also soon be time to thin apples, plums, and peaches to ensure a good fruit load. Pears and cherries don’t need to be thinned, as they aren’t subject to the “alternate bearing” of other types of fruit and can carry a heavier load.

Although we think of fall as the time to get perennials in the ground, there is still a window for planting perennials this spring. Do it soon, while the ground is still relatively moist, to get the roots established, and stay on top of the watering through the first season when even drought-tolerant species need irrigation. For spring-planted perennials, it is especially important to apply a thick mulch of wood chips to conserve soil moisture and increase establishment success.

In the Garden

If you haven’t already made your annual crop plan, it’s not too late. Check your seed inventory, and purchase locally or order as needed. To expedite garden growth, you can purchase seedlings from your local nursery or one of the region’s many plant sales.

Clear any overwintering plants, such as kale, chard, or cabbage, before they bolt and become magnets for

aphids and other pests. Weed whip or pull weeds before they flower and set seed. It’s also time to take down your cover crops—either chop and till them into the soil, or use them along with your cleared weeds and spent crops to get a compost pile underway, mixing greens with “browns,” such as straw, dried leaves, or stable bedding.

Once your beds are cleared, fork the beds or double dig as needed. If you need a reminder about garden bed preparation, check out the double digging video on the CASFS Youtube channel (youtube.com/user/casfsvideo/videos), or see the soil cultivation and other garden bed and compost preparation publications on the CASFS website, casfs.ucsc.edu/about/publications/for_the_gardener.html.

Equipment

As the rains taper off, make sure your irrigation systems are in working order. Check for leaks and other damage, and test the systems to be sure the coverage area is what you want. Turn on automatic systems as the soil starts to dry down.

Wash out and sun dry any six packs or other containers you’ll be using to avoid spreading infections from past diseases. You can also wipe down tomato cages and stakes with a very mild bleach solution (10 parts water to 1 part bleach).

Sharpen your tools to ensure clean cuts. Do a light sanding of wooden-handled tools and apply a coating of linseed oil to preserve the wood.

And finally, keep in mind the words of author Margaret Atwood –

“In the spring, at the end of the day, you should smell like dirt.”



Double digging beds in the Alan Chadwick Garden, UCSC.

Apprenticeship Updates

Meet the 2019 Apprentices

Here are brief introductions written by the new group of apprentices that joined us on April 8 from across the U.S., as well as Brazil, Chile, India, and Puerto Rico. For the next six months they'll live and work at the Center for Agroecology & Sustainable Food Systems' (CASFS) UCSC Farm & Alan Chadwick Garden, learning organic farming and gardening skills, and examining food system issues.

Your membership in the Friends of the UCSC Farm & Garden supports this internationally known training program by providing funds for scholarships, teaching staff, equipment, outreach, and facility improvements. You are a vital part of our work—many thanks!

Erika Aponte – I live in Bronx, New York and this past year I worked with Bronx Green-Up, a community outreach program of The New York Botanical Garden. I've also worked 5 years on urban farms with Active Citizens Project, a non-profit organization geared towards fighting social and health inequalities through urban farming. This apprenticeship will help strengthen my agricultural knowledge/skills so that I can better educate and empower working class and low-income community members.

Dare Arowe – I'm a chef and forager invested in food justice and sustainability. My interest is combining youth education and empowerment with storytelling, culinary history, and the physical and mental work of food production. At CASFS, I aim to make the transition from restaurant to field. My goals are to gain the knowledge and skills necessary to manage a professional farm and kitchen intended to support queer youth of color.

Matthew Baird – I grew up and currently live in Los Angeles. For fun, I read, play tennis, and explore my gloriously wacky city. For work I maintain veggie gardens in residential backyards. I also occasionally replace grass turf with Southern California native plant gardens. As an apprentice, I hope to develop business concepts that synthesize urban farming and water conservation (two things that LA could use a lot of help with).

Nadia Barhoum – I live in Berkeley and recently moved back from Greece and Jordan, where I was working supporting asylum processes for refugees. Before this, I was a researcher at Cal and worked on issues of food sovereignty and climate change, refugee rights and developing strategies to build community power. As an apprentice I look forward to learning more about how to create pathways for healing through sustainable land-based initiatives within my community.

Lucy Asako Boltz – I live and work in Oakland. I have experience working on two small-scale organic farms in Rhode

Island as a workshare, developing local history projects, volunteering with immigrant rights organizations, and living in intentional communities/ co-ops. I am excited to learn a lot from all the other staff and apprentices.

Ricky Buchalter – Broward County Florida. Homeless Garden Project. Artistic outlet is creating lyrics for hip hop/rap. I enjoy gardening for therapy and to sustain a healthy lifestyle. I want to use my CASFS experience to teach others and show people how powerful gardening is.

Pollyanna Bulhoes de Melo – I grew up on a farm in Maceio, Brazil and have been living in the US since 2014. I just moved from New Hampshire to Santa Cruz with my husband, Alex, who will also be an apprentice! My priority in my personal and business lives is to have and promote a healthy lifestyle. My goal is to learn as much as I can about agriculture in order to attain that lifestyle and use my knowledge to help others.

Susana Cabrera-Mariz – I hail from San Jose, California. This past year, I interned through the Rogue Farm Corp with Sun Spirit Farm in Grants Pass, Oregon and Diggin Roots Farm in Silverton, Oregon. Prior to that, I participated in the Multi-national Exchange for Sustainable Agriculture's Beginning Farmer Training Program and interned at Veggielution Community Farm. My educational background is in Environmental Sciences from San Jose State University. My hope is to gain knowledge and experience in order to make our food system more equitable and just.

Sugar Caradonna – I am originally from Long Beach, California and moved to the Bay Area to finish my BS degree at SFSU in Cell and Molecular Biology. I have over ten years experience in the healthcare industry. My husband and I are happy newlyweds sustained by our faith. Agroecology is a passion of mine and I look forward to learning about sustainable food systems in order to strengthen my new family and educate underrepresented communities.

Jiyeon Choi – I grew up in Los Angeles and moved to Santa Cruz to complete my undergraduate degree at UCSC for Environmental Studies-Agroecology and Studio Art. I am interested incorporating art with the environment and want to reconnect folks on sustaining a relationship to their food via gardening, nutrition, and composting. I am most interested in soil and pest management and looking forward to this season!

Courtney Cichowicz – I'm a graduate of the Environmental Studies Program at UC Santa Cruz. In the years since then I've lived somewhat of a nomadic life, travelling and moving frequently, always knowing that a traditional 9-5 career wasn't for me. During my time at CASFS I hope to pursue a more intentional path and gain the knowledge and skills necessary to pursue a career in sustainable agriculture and to start my own farm homestead.

Elise Dahan – I was born and raised in Manhattan, New York where I currently reside. I am looking forward to learning about IPM, plant propagation and seed saving among other topics. I also hope to learn more about how I can be a better advocate for planet earth and its inhabitants. I am excited to meet others who are also curious and passionate about sustainable growing.

Pia Desangles – I live in Central Florida, where for the last four years I was working with the Agroecology Project of the

Farmworker Association of Florida. I was part of a team that developed several community gardens in rural, farmworker communities and that was connected to the larger movements for food sovereignty. I hope to strengthen my agricultural skills and knowledge at CASFS, so that I can provide fresh food to my community in Central Florida.

Carter Draves – I am a woman from northern Colorado, originally from Indiana. For 20 years I have been immersed in the field of western medicinal plants with a permaculture-inspired approach to gardening. I plan a small integrated farm with an emphasis on medicinal plants/shrubs/trees; vegetable and fruit crops, as well as heritage livestock (dairy goats, poultry). Also to provide an outdoor classroom for experiential learning to folks in my community seeking knowledge of greater self-sufficiency.

Yanéé Ferrari – I was raised in New York City and currently live in Oakland. This past year, I participated in the Multi-national Exchange for Sustainable Agriculture's Beginner Farmer Training Program and spent some time volunteering and apprenticing at Soul Flower Farm in El Sobrante. I am committed to facilitating healing and food justice in Black communities. In my free time, you can find me meditating, reading, dancing, and learning about herbal medicine, and Indigenous spirituality.

Dana Gaffin – I currently live in Denver, Colorado, but California is home. I do plan to move back here. I completed the "Veterans to Farmers" program at Denver Botanic Garden's Chatfield Farms in July of 2018 and will be attending the Advanced Session for 10 weeks starting in January 2019. I'm also a CSU certified farrier (that's a horse shoer).

Dominic Gaffney – I have spent most of my life living between California and Scotland. My farming experience so far has included an apprenticeship at Green Gulch Farm in Muir Beach, California and a season on the Vegetable Crew at Front Porch Farm in Healdsburg, California. I see CASFS as a great place to develop ideas for new projects and shape my path forward in agriculture.

Anandi Gandhi – Originally from India, I moved to the San Francisco Bay Area 2 years ago where I have been working as the instructor for a landscaping and horticulture training program. I have a background in regenerative design, organic farming, environmental education, and research. I hope to work with farmers at the edges of where wildlife and farmlands meet and struggle for space and survival. I am passionate about soil regeneration, redwood trees, and elephants.

Jaime Hatch – I currently live in Oakland and work at Three Babes Bakeshop, a woman-owned small business focused on sourcing sustainable, local ingredients. I spent several years in environmental/farm education, and know I have so much to learn. Through this apprenticeship, I aim to gain practical skills in farming, education, and social justice that will allow me to be a better leader and educator in a food justice-based organization that aligns with my values.

Alex Hirshberg – I am from Concord, New Hampshire, and just moved to Santa Cruz with my wife, Polly, who will also be an apprentice! During the 2018 summer we were harvesters at Brookford Farm, where we fell in love with the work. Prior to that I was the Supply Chain Manager at Preserve, an eco-friendly consumer products company, for three

years. My goal is to apply my business experience and the knowledge gained from CASFS to work in the organic food industry.

Daniel Ishofsky – I've been a volunteer co-manager at Alemany Farm in San Francisco, California for the past 6 years (I had a day job too. It was ok). The farm is a hub of volunteerism, education, and community activity, where all the food is given away for free. I'm excited to delve more deeply into agricultural education, equity, and practice, learning with and from everyone at CASFS and bringing that knowledge into current and future farming projects.

Noelle Katz Iturregui – I'm from Santiago de Chile, South America. I studied Agronomy in Universidad Católica, also in Santiago, and worked for the past two years in the agro-ecological garden of the university in garden maintenance and teaching high school students about sustainable farming. The degree I studied was more theoretical so I'm looking forward to the apprenticeship style of teaching and having my own educational farm in the future.

Charlotte Kett – I live in Felton, California, but am originally from North Carolina. I studied environmental science at the University of North Carolina at Asheville. Since graduating I have worked on a biodynamic farm at a Waldorf school in Santa Rosa, California as well as an educational farm called Hidden Villa in Los Altos Hills, California. I am excited to learn the skills to help me start my own farm in the future.

Daniel Lopez – I was the founder of the R'Pantry at UC Riverside, which provides fresh and non-perishable foods to students in need. During my time at CASFS I look forward to gaining a deeper understanding of the food system as it pertains to agriculture and share this knowledge in Southern California to support the resurgence of locally produced food for local school districts and low-income communities.

Emily Maheux – I grew up in South Hero, Vermont but currently live in Fort Apache, Arizona and work with Ndee Bikiyaa (The People's Farm), a tribal farm program of the White Mountain Apache Tribe. I'm so excited to fill in my knowledge gaps and practice skills that will better equip me to work at the intersection of physical/mental health, food systems, cultural revitalization and ecological restoration while learning about other inspiring projects that are underway.

Grecia Marquez-Nieblas – I have lived throughout Southern California since my family immigrated to the United States. Through personal and professional experiences I have developed a passion for holistic community wellness that bridges mental health and agriculture to bring healing. My goal at CASFS is to develop skills in sustainable agriculture that will help me work toward increasing access to growing spaces for communities of color and individuals struggling with diverse mental health concerns.

Madeline Newel – I received my undergraduate degree from New York University in Environmental Science and "Politics, Rights, and Development." I wrote my thesis on the agricultural labor shortage in California, focusing on the failures of our mainstream food system, and the maltreatment of farmworkers. At CASFS, I hope to obtain environmentally sound farming skills and to strengthen my understanding of food justice to prepare for a postgraduate education in agroecology/sustainable food systems.

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Maycee Pogue – I'm from San Mateo, California. I've worked with several environmental and educational nonprofits in San Francisco servicing gardens with youth groups, educating youth about the importance of healthy food systems, and operating a native plant nursery. My hope is to help communities create biodiverse, resilient, culturally appropriate and community operated farms and gardens applying the tenets of Traditional Ecological Knowledge and Honorable Harvest while also restoring native plant communities to support more than human life.

Caitlin Rowles – In 2015, I finished my studies in Global Food Systems at New York University. Since then, I have fallen in love with the Bay Area working in tech recruiting. Now, I'm eager to jump back into work that fuels my fire! I look forward to gaining practical agricultural skills, growing with and from the apprentice community so that I can contribute to a more just and sustainable food system, and create opportunities for people within it.

Ricardo (Riki) Santos – I'm from Puerto Rico. I'm a seed of Huerto Semilla (HS), a community farm and school inside University of Puerto Rico's Río Piedras campus dedicated to the cultivation of healthy, constructive, and sensible social dynamics; learn, practice and teach ecologically conscious farming. For us at HS, CASFS is a source of inspiration and guidance. All knowledge acquired from CASFS will be shared with the HS community and all who we reach.

Harrison Siegel – I have spent the better part of the last decade working as a bicycle messenger and dispatcher in New York City. I live in Brooklyn with my spouse, Chelsea, and a few unferaled cats that decided to be born in my closet. I hope CASFS can, in part, provide a comprehensive knowledge base to help my pursuit of long-held interests in food access and policy issues, particularly as related to urban geographies.

Kiernan Skelly – I am from Minneapolis, Minnesota and spent this past season working at Earth Dance Farm, a Community Supported Agriculture (CSA) farm in Spring Valley, Minnesota. I studied environmental justice at the University

of Michigan in Ann Arbor, Michigan and am looking forward to learning about the social impacts of sustainable farming while getting to work on the CASFS farm. My goal is to one day have a farm of my own.

Apollo Stratemeier – I've enjoyed 26 challenging trips around the sun. Midway through the 22nd I started attempting to utilize its energy to grow food, and soon found my first farm job at a sustainable family farm in Pennsylvania. Four seasons have steadily enriched my life's soil. This previous year I was able to independently source a fledgling local market with food I helped grow, an encouraging step in my dream of establishing cooperative growth between people in sustainable communities.

Will Urmston – I live in Massachusetts and when not landscaping, I've been trying to make my family's land sustainably productive through gardens and an orchard. I studied permaculture at the Yestermorrow School and recently finished an MFA in environmental art in Scotland. Through CASFS I hope to deepen my understanding of agricultural practices while also continuing to explore the ways in which art and farming can be interwoven to encourage connectivity between humans and nature.

Nina Vukicevic – For the past four years, I have been working at Costanoa Commons Farm (CCF) in Santa Cruz. At CCF, people with and without disabilities participate in our urban community farm to grow a variety of vegetables, herbs, and flowers while providing farm skills training, internships, education and micro-enterprise opportunities. During my time at CASFS, I intend to strengthen my agricultural skills so I can bring my knowledge back to CCF.

Katharine Wyatt – I grew up in Santa Rosa, California. After college in Miami, Florida, I managed media relations for a New York City restaurant, Cosme. While in NY I interned at the farm-to-table restaurant Blue Hill and hand-scale vegetable/livestock farm, Craigardan. Last season I completed the Flower Farming Apprenticeship at Front Porch Farm in Healdsburg, California. I plan to use my CASFS knowledge to help advance supply chain relationships that encourage and sustain agroecological farming practices.