Conservation Plan Supporting Organic Transitions

Open Source Ag
2024

ELATIONSCAPES
ecological landscaping & permaculture design

Cover Page

Conservation Agriculture Planning Grants Program offered by : U.S. Department of Food and Agriculture

CPA 138 Participant
Kelly Cooper | Conservation Agriculture Planning Grants Program
23-0374-000-SG | Open Source Ag
2620 Grey Hawk Way, San Miguel
California 93451

TSP
Blaze Elation | Elationscapes
6447 Webster Road, Creston
California 93432
805-400-4999
blazeelation@gmail.com

Farm Identification
Open Source Ag, Kelly Cooper
2620 Grey Hawk Way, San Miguel
California 93451
559-670-0352

Statement

I certify the work completed and deliver for this CPA

- Complies with all Federal, State, Tribal and local laws and regulations
- Meets the General and Technical Requirements for this CPA
- The planned practices are based on NRCS Conservation Practice Standards in the state Field Office Technical Guide where the practices are to be implemented.
- Is consistent with and meets the conservation goals and objectives for which the program contract was entered into by the participant.
- Incorporates alternatives that are both cost effective and appropriate to address the resource issue(s) and participants objective(s).

TSP Signature : _____ **Date :** _____

I accept the completed CPA deliverables as thorough and satisfying my objectives

Participant Signature : _____ **Date :** _____

NRCS administrative review completion by:

Signature : _____ **Title :** _____ **Date :** _____

Problems, Opportunities, Objectives

General Description

The Participant's property is roughly 10 acres located in San Miguel, California. Situated amongst gentle rolling hills, this property is surrounded by many vineyards, farms, ranches, and rural properties. The property usage history is undetermined. When the participant acquired the property, the property was essentially non-disturbed; no soil grading nor any structures existed on the site. Since acquiring the property the participant has constructed two small buildings for a house and office space, completed landscaping surrounding the immediate home area, installed deer fencing, and put into motion several efforts in farming operations and property management. Participant has identified goals and objectives, in summary: to grow and donate organic food to support the community.

Problems

After meeting with Participant and examining collected data: field tests including soils analysis, site studies/observations, topographical map, sun exposure and direction, typical wind, rain, and other weather patterns, several problems and opportunities were identified. The main problems and opportunities identified were:

- High potential for soil erosion due to a steep slope in the growing area
- Exposure to high winds due to surrounding topography - rolling hills
- Potential for improvement of soil health, high clay content
- Extensive disturbed soils from construction - risk of soil erosion
- Little to no privacy screening along property edges
- Typical occurrences of extremely high temperatures during summer months

Opportunities

After identifying participants growing site problems, we moved on to developing sustainable practices, effective methods, and creative strategies to address our identified set of problems. In other words, we aimed to transform problems into solutions and opportunities to accomplish the Participants objectives for their organic grow-to-donate farm. After creating an initial design (seen on the following page), visiting the site, and reviewing collected data, we identified the following list of potential opportunities:

- Terracing the main hill to prevent erosion, provide rows for fruit tree planting with easy access for tractors to conduct maintenance
- Jute netting application on steep slopes of terraces to prevent erosion and stabilize hillside
- Cover cropping terraced area to enrich soil health and reduce erosion
- Shade house structure to provide a cooler work space and grow area for seed starting
- Multiple wind-break tree plantings to combat high wind exposure which protects the growing operation from dust and wind, as well as protects the house and provides privacy.

Objectives

Participants stated Mission, Vision, and Values…

Mission

To grow a prosperous and healthy community connecting food, fun, tech, and farming.

Vision

A participatory network of open-source local grow-to-donate food systems to reconnect people with the joy of growing, preparing, and sharing good food.

Values

Who We Are

- Open and Social
- Ethical and Caring
- Playful and Participatory
- Caretakers and Stewards

What Guides Us

- Embedding people as participants in secure and resilient local food systems
- Propagating inter-generational and trans-cultural connections between people, food, and farming
- Cultivating deep connections between food and community wellbeing
- Nurturing healthy relationships with food, the natural world and with each other
- Feeding better life chances for everyone
- Supporting the environment, water, soil and food health using organic methods (respecting a balance with nature).

Desired Future Condition

Desired Resource Uses

- Grow organic fruit and produce to donate to the local food bank while improving soil, water, air, and human health quality.

Resource Problem Reductions

- Utilize land use practices that reduce adverse effects such as erosion, top soil depletion and habitat reduction.

On-site Ecological Protection

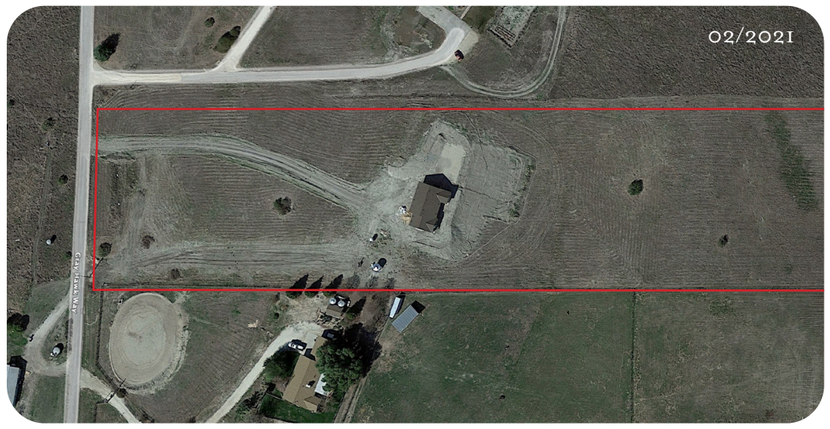
- Create habitat for pollinators and birds. Manage soil health. Plant natives to improve air quality and sequester carbon.

Production Concerns

- Produce as much produce as possible keeping in mind limited labor available. Grow produce desired by the local food bank.

Inventory Resources

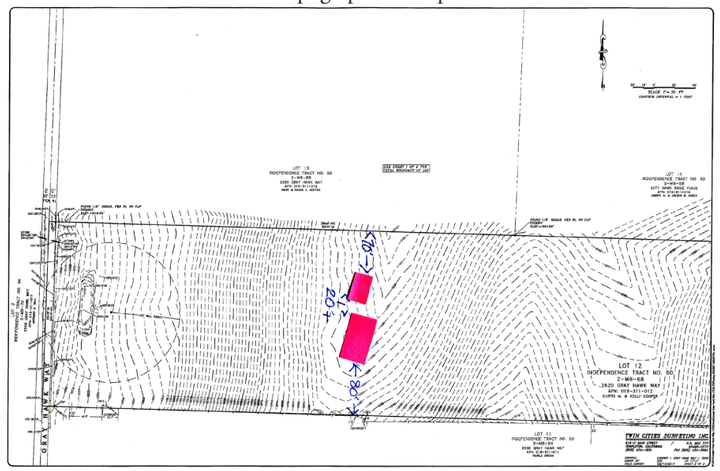
Property condition prior to participant ownership - Benchmark Site Condition



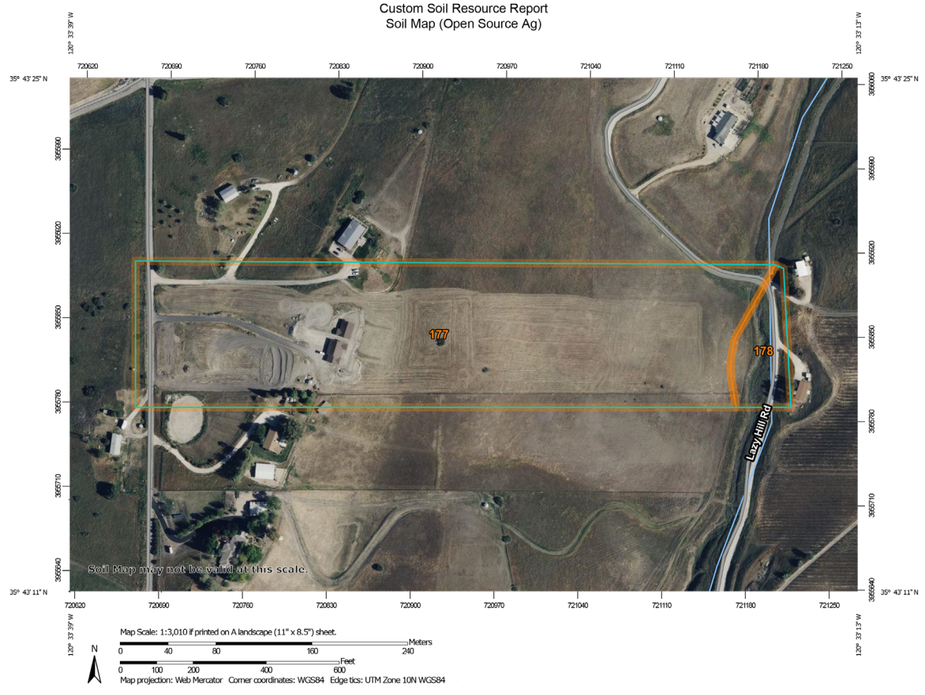
Home construction prior to farm development

Preparatory stages of farm development: Grading, Irrigation install

Topographical Map



Custom Soil Resource Report
Soil Map (Open Source Ag)



Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
177	Nacimiento-Ayar complex, 9 to 30 percent slopes	15.1	93.5%
178	Nacimiento-Ayar complex, 30 to 50 percent slopes	1.0	6.5%
Totals for Area of Interest		**16.2**	**100.0%**

A topographic map informed the design of the farm and orchard. The west-facing property exhibited variations in slope. Steeper areas were terraced to create ten level terraces suitable for tractor traversal across the slope. Flatter areas were designated for row cropping, while steeper slopes were allocated for perennial fruit trees, requiring less labor for maintenance. Terracing facilitated tractor usage and mitigated water runoff, promoting rainwater infiltration.

The farm property soil is characterized by a soil complex. The complex is made up of two soil types, the Nacimiento and the Ayar soil. This soil is characterized as silty clay loam and classified as being not prime for farmland. The soil type drains well, but also has the potential for runoff.

177—Nacimiento-Ayar complex:
Mean annual precipitation: 10 to 20 inches
Mean annual air temperature: 60 to 61 degrees F
Frost-free period: 200 days
Farmland classification: Not prime farmland
Nacimiento typical profile:
H1 - 0 to 18 inches: silty clay loam
H2 - 18 to 28 inches: silty clay loam
H3 - 28 to 32 inches: weathered bedrock
Drainage class: Well drained
Runoff class: Very high
Ayar typical profile:
H1 - 0 to 9 inches: silty clay
H2 - 9 to 61 inches: clay
H3 - 61 to 65 inches: weathered bedrock
Drainage class: Well drained
Runoff class: Very high

Inventory Resources

10 SOIL ANALYSIS | Soils External Labs Reports Data

Test Site 1 Garden Bed ***3/19/22***	*Test Site 2+3 (Orchard-no front/back separation)* ***3/19/22***	*Test Site 2 (Orchard terrace back tiers)* ***11/18/22***	*Test Site 3 (Orchard terrace front tiers)* ***11/18/22***
Organic Matter 2.4%	*Organic Matter 2.5%*		
CEC 19.4 meq/100g: K 5.5, CA 77, MG 17	*CEC 19.4 meq/100g: K 4.8, CA 80, MG 15*	*Boron, Soluble .2 mg/L*	*Boron, Soluble ND*
Calcium 11938 lb/acre avail nutrient	*Calcium 13958 lb/acre avail nutrient*	*Calcium Soluble meq 2.1 meq/L*	*Calcium Soluble meq 4.6 meq/L*
Manganese 148 lb/acre avail nutrient	*Manganese 138 lb/acre avail nutrient*	*Electrical Conductivity .44 mmhos/cm*	*Electrical Conductivity .59 mmhos/cm*
Micronutrients Copper 5.6 lb/acre	*Micronutrients Copper 4.0 lb/acre avail nutrient*	*ESP 1.0%*	*ESP ND*
Iron 71 lb/acre	*Iron 54 lb/acre avail nutrient*	*Lime Presence 4*	*Lime Presence 4*
Magnesium 916 lb/acre avail nutrient	*Magnesium 774 lb/acre avail nutrient*	*Magnesium Soluble Meq .6 meq/L*	*Magnesium Soluble Meq .9 meq/L*
Soluble Salts .19 mmhos/cm	*Soluble Salts .23 mmhos/cm*	*Sodium, Soluble meq 1.8 meq/L*	*Sodium, Soluble meq .6 meq/L*
pH 7.7	*pH 8.0*	*pH 7.9 units*	*pH 7.7 units*
		Saturation Percentage 51%	*Saturation Percentage 52%*
Potassium 994 lb/acre avail nutrient	*Potassium 842 lb/acre avail nutrient*	*Potassium, Extract 398 mg/kg*	*Potassium, Extract 628 mg/kg*
		Nitrate Nitrogen as NO3-N, Extract 3 mg/kg	*Nitrate Nitrogen as NO3-N, Extract 6 mg/kg*
Phosphorus 98 lb/acre avail nutrient	*Phosphorus 58 lb/acre avail nutrient*	*Phosphate as PO4P, Extract ND*	*Phosphate as PO4P, Extract 6.0 mg/kg*
Zinc 2.2 lb/acre avail nutrient	*Zinc 1 lb/acre avail nutrient*	*Zinc, Extract ND*	*Zinc, Extract .2 mg/kg*

This chart summarizes the results of two soil tests conducted in March 2022 and November 2022. Each test analyzed samples from two distinct areas:

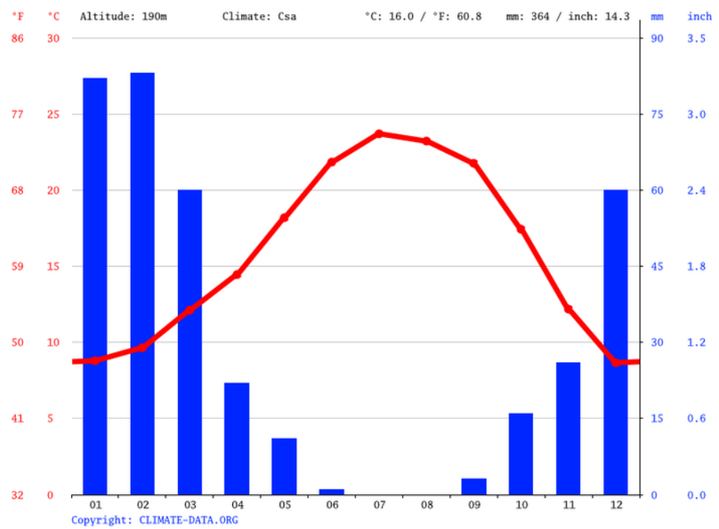
- March 2022: Garden area vs. entire orchard terrace
- November 2022: Uphill half of the terraced orchard vs. downhill half

Overall Observations:

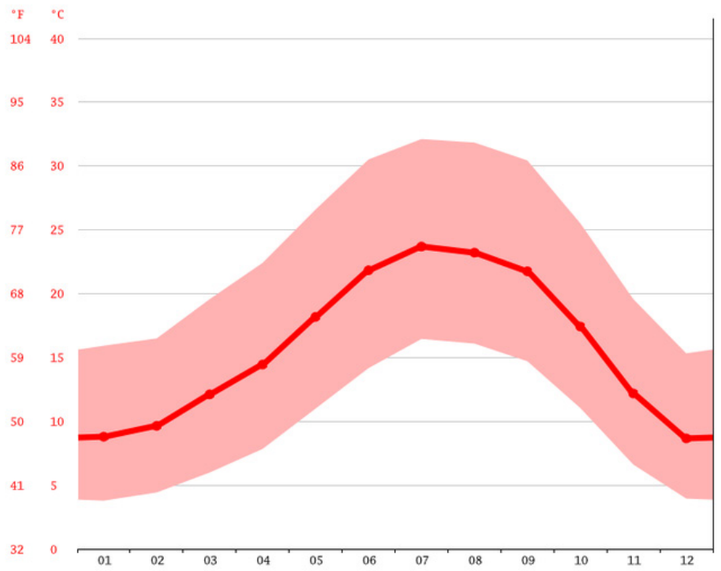
- Tests revealed consistent results across all sampled areas.
- Organic Matter: Levels exceeded 2% in all areas, indicating healthy soil conditions.
- pH: The soil leans slightly alkaline (high pH).
- March 2022 - Nutrients: This test showed higher levels of phosphorus, zinc, iron, and potassium in the flat garden area compared to the hillside orchard terraces. This difference could be attributed to erosion, where soil and nutrients are washed down from the slope and deposited on the flatter ground.
- Potassium, Phosphorus
- November 2022 - Nitrogen: Notably, available nitrogen levels fell below 10mg/kg in all tested areas, suggesting a need for improvement.
- Micronutrients: Zinc, Iron, Copper, Manganese, Calcium, Magnesium, Sodium: Levels appear sufficient in all areas based on the results in this image.
- Electrical Conductivity (EC): EC measures the amount of salts in the soil. The results in this image show elevated levels of EC in the orchard terraces (Test Sites 2 & 3) compared to the garden area (Test Site 1). This could be a sign of salt buildup.

Inventory Resources

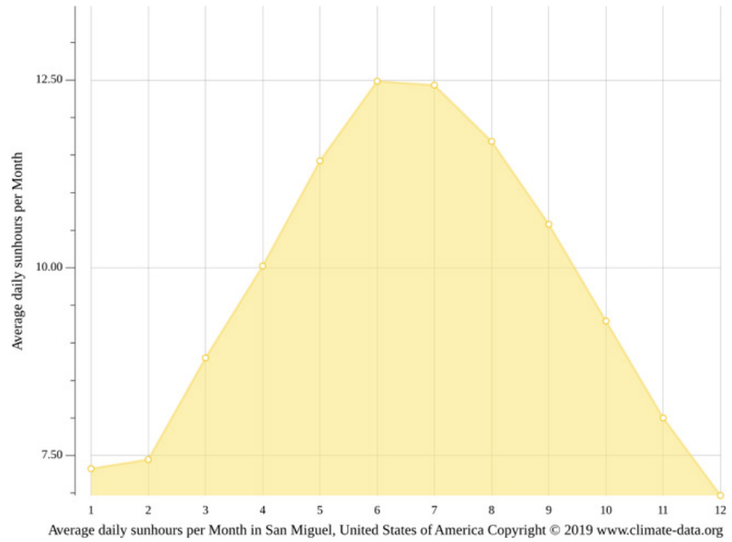
San Miguel Climate Conditions



Precipitation + Temperature



Temperature



Sun Hours

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature °C (°F)	8.8 °C (47.8) °F	9.6 °C (49.4) °F	12.1 °C (53.8) °F	14.4 °C (58) °F	18.2 °C (64.7) °F	21.8 °C (71.3) °F	23.7 °C (74.6) °F	23.2 °C (73.8) °F	21.8 °C (71.2) °F	17.4 °C (63.4) °F	12.2 °C (53.9) °F	8.7 °C (47.6) °F
Min. Temperature °C (°F)	3.8 °C (38.8) °F	4.4 °C (40) °F	6 °C (42.8) °F	7.8 °C (46.1) °F	11 °C (51.8) °F	14.2 °C (57.5) °F	16.5 °C (61.6) °F	16.1 °C (61) °F	14.7 °C (58.5) °F	11 °C (51.9) °F	6.6 °C (43.9) °F	3.9 °C (39.1) °F
Max. Temperature °C (°F)	15.9 °C (60.7) °F	16.5 °C (61.7) °F	19.6 °C (67.2) °F	22.4 °C (72.3) °F	26.6 °C (79.9) °F	30.5 °C (86.9) °F	32.1 °C (89.8) °F	31.8 °C (89.3) °F	30.4 °C (86.8) °F	25.5 °C (77.9) °F	19.6 °C (67.2) °F	15.3 °C (59.6) °F
Precipitation / Rainfall mm (in)	82 (3)	83 (3)	60 (2)	22 (0)	11 (0)	1 (0)	0 (0)	0 (0)	3 (0)	16 (0)	26 (1)	60 (2)
Humidity(%)	70%	72%	64%	54%	47%	44%	49%	51%	51%	56%	64%	70%
Rainy days (d)	5	6	5	3	1	0	0	0	0	1	3	5
avg. Sun hours (hours)	7.3	7.4	8.8	10.0	11.4	12.5	12.4	11.7	10.6	9.3	8.0	7.0

Data: 1991 - 2021 Minimum Temperature, Maximum Temperature, Precipitation, Humidity, Rainy Days

Data: 1999 - 2019 Average Sun Hours

"The weather conditions in San Miguel are characterized by a mild and moderate climate. The winter months are much rainier than the summer months in San Miguel. This location is classified as Csa by Koppen and Geiger. The mean temperature prevailing in the city of San Miguel is recorded as 16.0° C | 60.8° F, according to statistical data. About 364 mm | 14.3 inch of precipitation falls annually. San Miguel is located in the norther hemisphere. The balmy days of Summer commence at the end of June and conclude in September. This period encompasses the months: June, August, September."

- Climate Data

https://en.climate-data.org/north-america/united-states-of-america/california/san-miguel-124993/

Initial Property Design

Original Design and Adjustments

This map showcases the initial property plan drafted in early 2022. It highlights the changes implemented based on further evaluation and site observations.

Original Plan Details

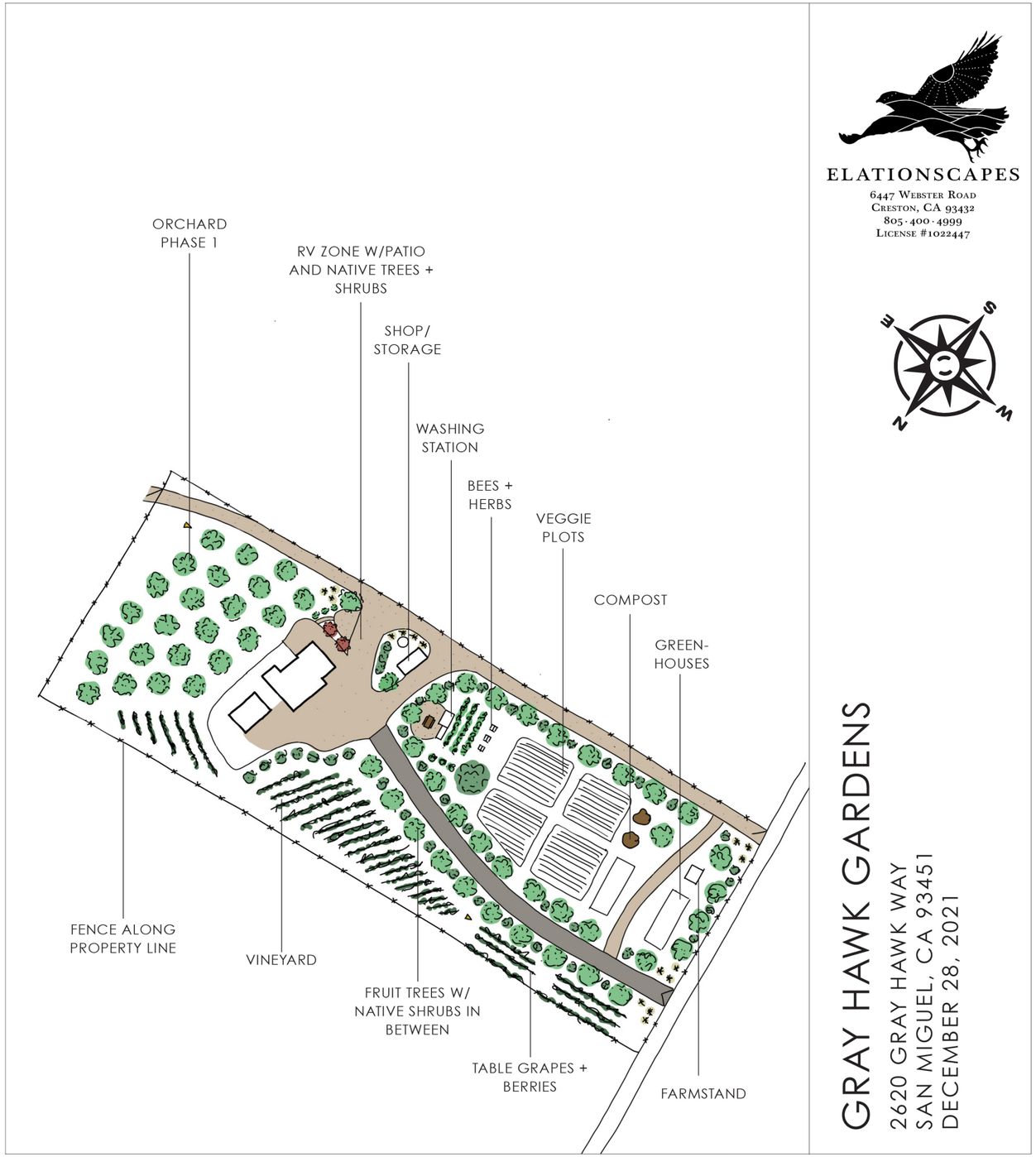
- The initial plan envisioned row crops extending uphill onto the currently designated orchard area, with a significant slope.
- A small vineyard was included on the north side of the driveway.
- Fruit trees were planned on both sides of the driveway and behind the house near the leach field.

Reasoning Behind Adjustments

- Assessing the slope's feasibility for agriculture led to the decision to limit row cropping to the flatter areas west of the orchard. This change prioritizes minimizing erosion and facilitating the use of smaller equipment.
- The vineyard was replaced with a dedicated native plant habitat area.
- Fruit trees originally planned for the driveway and septic field were relocated to the terraced front hillside. This consolidation streamlines orchard management and leverages the terraces for optimal fruit production.

Conclusion

- Through continued on-site observation of weather patterns and usage, the initial design has been thoughtfully revised to optimize the property's potential while prioritizing efficiency and conservation



Notes & Correspondence

PARTICIPANT & TSP

- November 2021: First met Kelly and Kurt to discuss their property goals: grow-to-donate vegetable gardening, greenhouses, orchard, pollinator services. Outlined some property challenges: rodents, slope, need for infrastructure (terracing, ag roads, and irrigation)
- December 2021 - February of 2022: Created a first draft overall property design and a home landscape plan. Focusing on the front half of the property (phase 1), our goal was to create areas for fruit trees, green houses, and row crops. Some additional ideas included a farm stand, wash station, bees, owl boxes, small vineyard, and additional fruit trees over leach field.
- March 2022: Designed an irrigation layout for the farm and orchard. Took soil samples of the ag plots and orchard.
- April – August: Installed home landscape, DG driveway and RV pads. Covered as much bare soil as possible with woodchip mulch to hold in moisture, reduce erosion, and support soil life. Terraced slope on South of driveway for orchard location. The goal was to create flat rows to slow the movement of water down the slope and increase infiltration of water. We moved the topsoil from the slope cut to the terrace nose. This created a thick layer of top soil on the nose of the terrace where we planted the fruit trees.
- August -September: Build green house. The original idea for the green house was to grow the majority of the crops in the shelter and warmth of the green house. This seemed like the best option based on a site visit to Mount Olive Farm where most of their crop are grown in hoop-houses. Mt. Olive is in a similar climate, which made us believe that this would be a good option for us as well.
- November – December 2022: Install a 2" filter on main agricultural water supply line. The purpose of the filter is to remove any solids that may clog the irrigation system. Install irrigation valves for orchard and farm plot. Create 9 irrigation stations for farm and 3 stations for the orchard. Install major erosion control measures on orchard terraces. We were concerned with potential erosion of our newly disturbed/ tilled/ graded terrace soil with coming rainfall. In response, we applied jute netting to all steep slopes of the terraces and seeded the steep slopes with erosion control seed. The flat area of each terrace were seeded with nutrient boosting cover crop with the intention of tilling it into the soil in Spring to add organic matter and nitrogen.
- February 2023: Plant 89 fruit trees. We used an auger to dig a large planting hole for each tree. We used gopher baskets and a mix of several amendments as well as mushroom compost in each planting hole. Mushroom compost was chosen for the fruit trees due to fact that trees require fungus rich compost while row crops prefer bacterial rich composts. We positioned the graft scar facing North to reduce sun exposure. We also used plastic trunk guards to protect the base of the trees from rodents and sun damage.
- April: Staked all fruit trees with two metal t-stakes per tree and rubber tree ties. Our cover crop seeds grew incredibly well and required significant weed whacking and mowing. This was labor intensive by insured a huge addition of organic matter and nutrients to the soil. The high yield also indicated a high level of existing organic matter and soil nutrients, which agrees with our soil sampling results.
- May: Continued with mowing and tilling cover crop into soil. Also, significant mowing was required for fallow areas due to high rain fall.
- Summer: Kelly worked incredibly hard and produced a whole lot of wonderful produce from the greenhouse and the farm plot situated uphill from the greenhouse. She found that double digging the beds to prep for planting increased the yield and plant health significantly. We plan to double dig all planting areas this year. We hope to utilize the trencher to help use mimic a double digging approach with less labor. Kelly also started all her own seeds and transplanted them into the garden. She found out that she is very good at seeding. She plans to continue doing her own seeding this season as well.
- Fall: Planted a native wind block hedge of live oak trees at the top of the slope North of the driveway. The spacing is very close for these oak trees to create a solid wall of trees to slow and deflect the wind that races up the slope and blows right into the front yard of the home. The goal with this native hedge is also to create habitat for animals, insects, and pollinators.
- Fall: spread mushroom compost around the base of each fruit tree. This will add slow-release fertilizer and organic matter to the soil to prepare the trees for Spring. We also mulched the fruit tree rows throughout the orchard with a 4-inch-thick layer of woodchips. This will insulate and protect the soil life and roots from winter cold. It will hold in moisture, increase soil microbial activity, and provide sun protection for the plastic drip line. We plan to keep a permanent mulch layer on the fruit tree row while the rest of the terrace will not receive mulch so we can cover crop and till in Spring. We also plan to continue cover cropping the farm plot each winter and tilling in the Spring. Hopefully we can move toward a no-till or low till system once we have build up the soil organic matter.
- We learned that the hoop house got very hot in the summer and that the strong Fall winds were able to bend the frame and rip the plastic. We have decided to only use the greenhouse as a nursery – a place to start seeds. We found that vegetables did very well outside the greenhouse in the farm plot, so this growing season, we will focus on planting in the farm plots and reserve the greenhouse space for seeding and raising up starts for transplanting.
- We planted seven rows of grapes and berries. We plan to trellis these and possibly create a large bird net structure over them to reduce loss of fruit to birds.
- For the garden, we plan to divide the farm plot area into three roughly equal garden plots. We will install a rodent fence around the 3 plots as rodents were a significant challenge this past year. The three plots will allow us to keep track of what we grow and allow us to implement a crop rotation plan.
- We plan to reserve a large flat area in the farm plot for composting. We plan to try worm composting as well as hot composting. We will utilize our compost on the garden plots and continue using mushroom compost on the fruit trees.

Revised Site Plan Design

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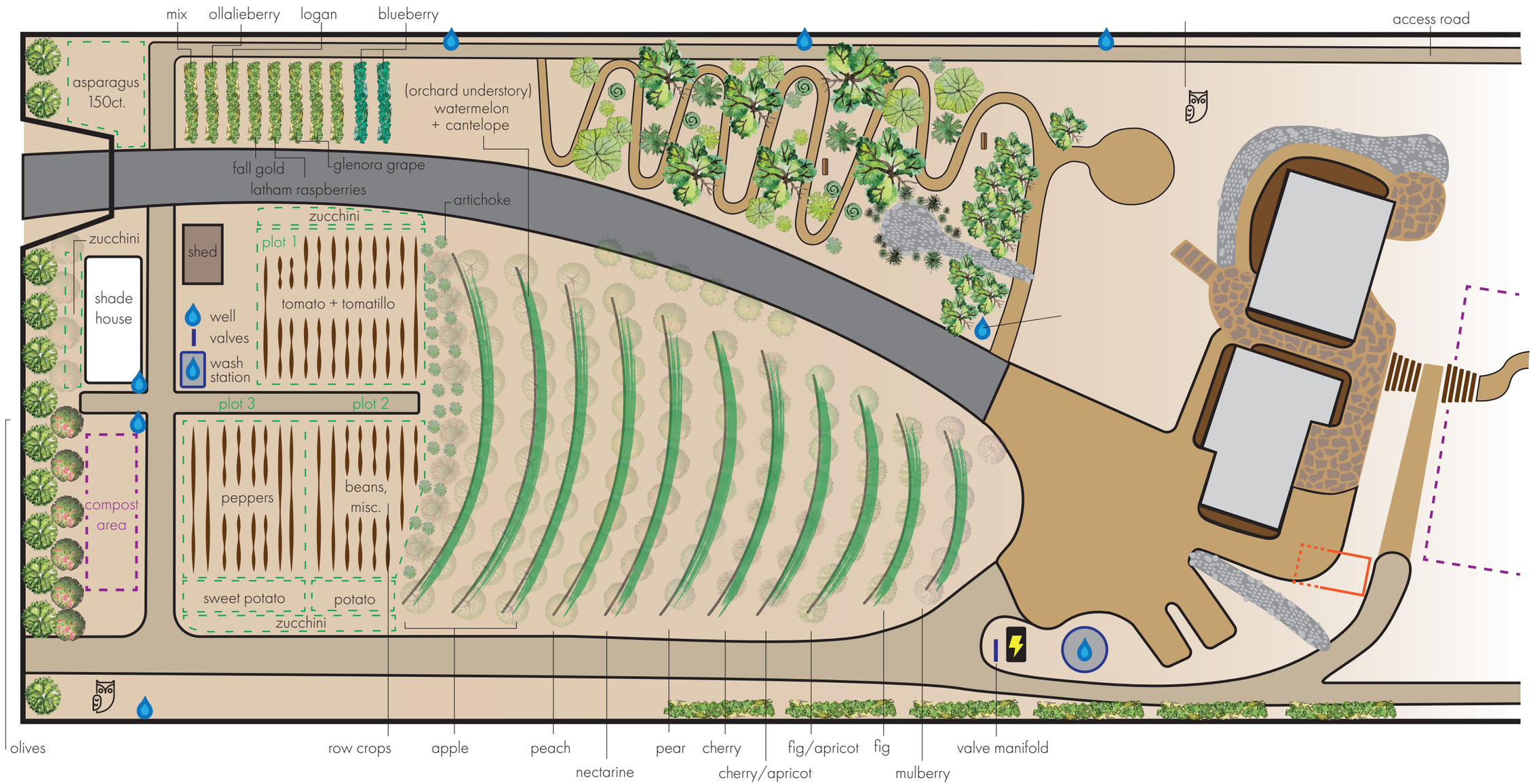
COOPER'S RESIDENCE

2620 GRAY HAWK WAY
SAN MIGUEL, CALIFORNIA 93451
DECEMBER, 2023

0′ 40′ 60′ 80′ 120′

N W E S

Garden Layout Focus



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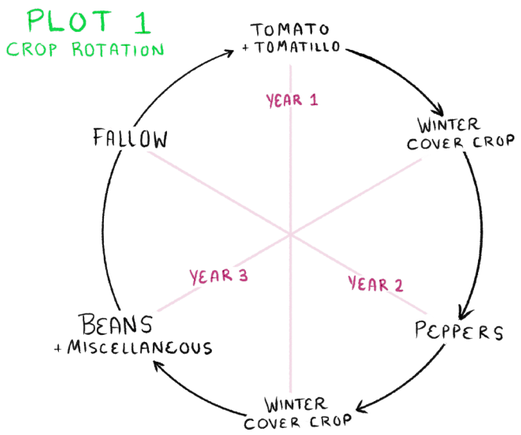
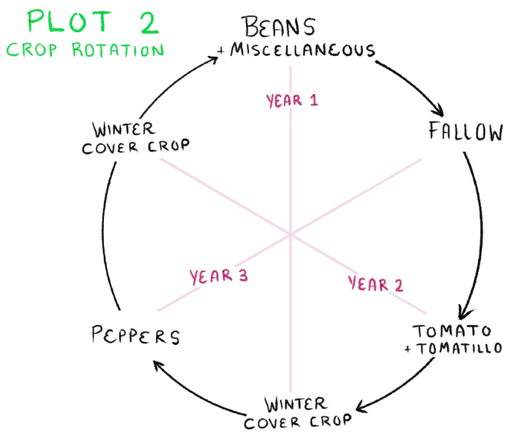
COOPER'S RESIDENCE
2620 GRAY HAWK WAY
SAN MIGUEL, CALIFORNIA 93451
APRIL, 2024

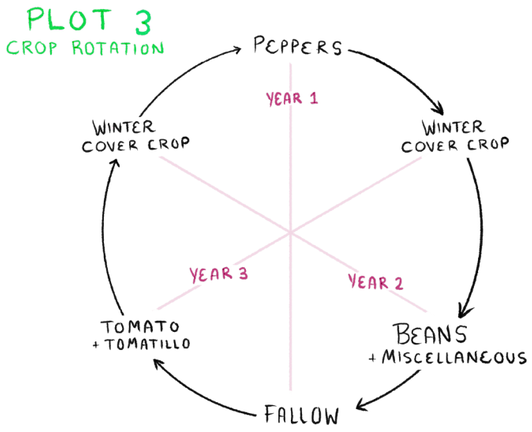
0′ 40′ 60′ 80′ 120′

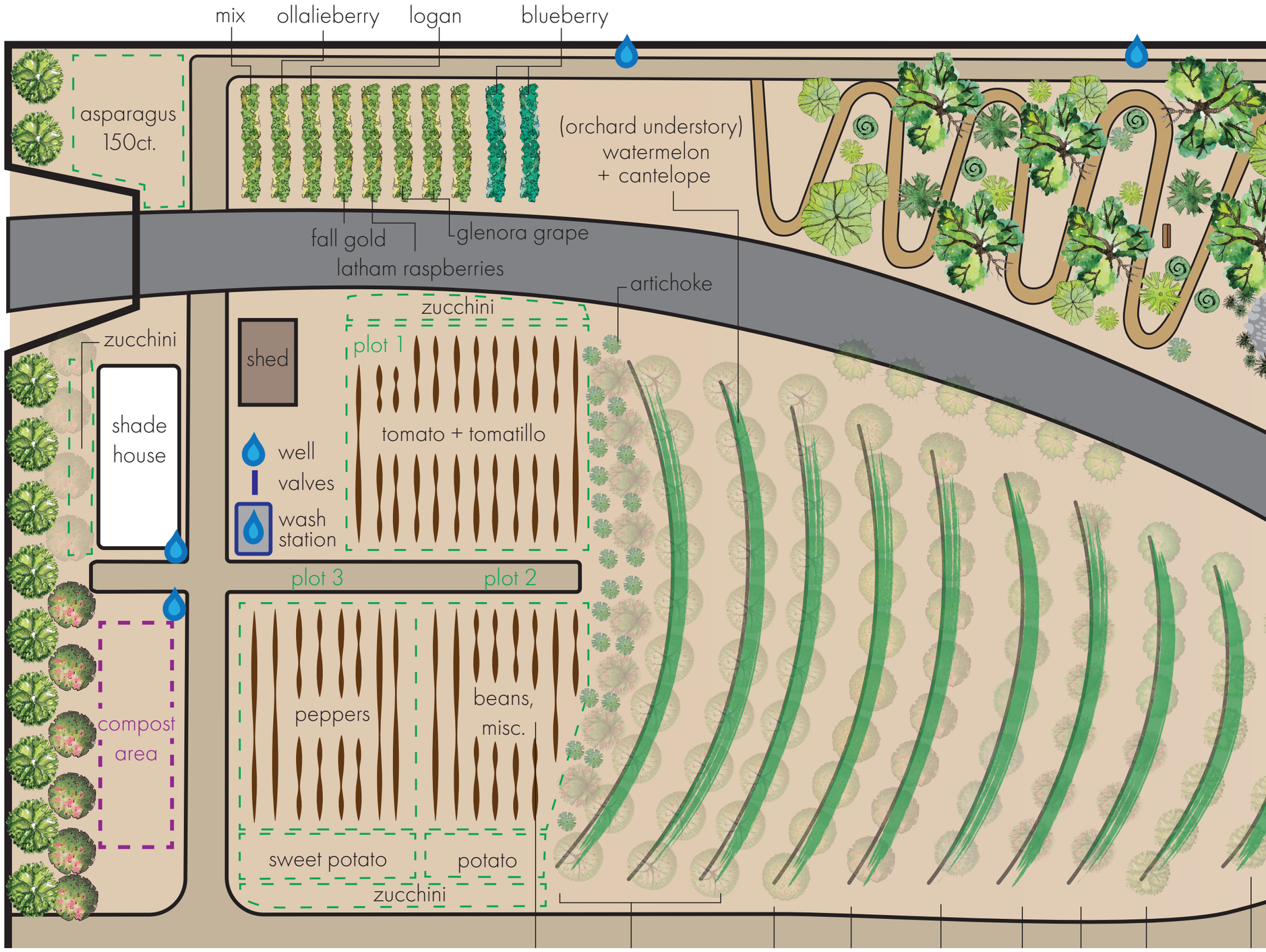
N W E S

Garden Layout & Crop Rotation









Mitigate Adverse Effects on Resources

Soil & Water

The new design of the property takes into account many considerations to mitigate adverse effects on resources. Terracing the orchard area mitigated excess erosion. By creating a more level growing surface on each terrace, we slowed the movement of water down slope. This allows more water to infiltrate while also reducing erosion. In addition to terracing, we applied 200lb of cover crop seed to the terraces in December of 2022. Large seed cover crop was applied to the terrace planting area while erosion control seed was applied to the steep slope of each terrace. Furthermore, jute netting was installed along the steep slope of each terrace. Additionally, we applied cover crop seed to the entire garden area. The cover crop helped to reduce erosion during the rain, conserve moisture in the soil, and create a source of nutrients for the soil. This cover crop was then tilled back into the soil in the Spring of 2023 to increase carbon and nitrogen levels in the soil. We plan to continue this practice of cover cropping and tilling each year to ensure healthy soil and mitigate erosion.

Wind & View

In order to address potential negative effects of wind and view windows, we focused efforts on planting olive trees along the front (west side) of the property, which serves many purposes. The evergreen row of trees improves the curb appeal of the property and serves as a wind-break for the lower garden area. The evergreen tree row catches silt that may be carried by the wind from neighboring properties and from soil disturbance occurring at Open Source Ag. The participants have noted that their property location is subject to high winds due to local topography. Through observation over the course of their property ownership they have witnessed notably high winds on many occasions - emphasizing the need for proper wind-breaks.

A wind block was also planted at the top of the hill between the home and the farming area. This windblock is comprised of native Live oak trees. The evergreen hedge of oaks will reduce the strong spring winds as they move up the hill and toward the home. This creates a more pleasant living environment for the residents as well as a better growing environment for the landscape plants surrounding the home.

The new property design also includes a windbreak along the south side of the property made up of toyon plants. This will serve to reduce wind, provide privacy from neighbors, and create forage for pollinators.

Farming Practices

Tillage

Currently we use minimal shallow tillage in the spring to prep the soil for planting. We plan to transition away from tillage and into a no-till ag system over time.

Double Digging

In the first spring, the participant double dug a portion of the garden by hand. She realized that it was a huge laborious task, but did have noticeable benefits to growth. This spring, we plan to utilize a trencher to simulate double digging. We plan to trench the garden beds and incorporate compost. We will then fill the trenched areas with the compost soil mixture.

Mulch

We applied a 4” thick layer of woodchips to all of the fruit trees and berries. This will serve to rescue weeds, conserve moisture, add slow release organic matter, and protect drip lines from the sun.

Nutrient Application

We incorporate a series of nutrients at each planting.

For each fruit tree we applied:

- 10 pounds mushroom compost
- 2 pounds Calphos
- ⅛ cup humate
- 1 tablespoon mycorrhizal fungi
- ¾ cup vermicompost
- ⅛ Tiger 90

For berries we applied the same combination at a reduced quantity per plant.

In addition to adding nutrients at planting time, we topdressed the fruit trees and berries with compost a few months after planting at a rate of 5 pounds mushroom compost per plant.

Human Concern

The new property design takes into account the participants unique goals and management style. The participant is a non-profit that chooses to donate all produce to the local food bank. Profitability is not a concern of this farm, yet production quality, production quantity, and diversity is paramount. Rather than focusing on profitable crops, we are focusing on a diverse selection that the food bank is seeking. We are aiming for high production; our goal is to increase the number of pounds of produce donated each year.

Labor is a limited resource that we have considered carefully throughout the design process. The participant and her husband perform all the day-to-day tasks of the farm. Elationscapes team has performed seasonal prep, tractor work, tree planting, grape and berry planting, grape and berry trellising, yearly spring weed abatement, and other tasks. To make the most out of the limited labor force, we have chosen many perennial crops that require less labor. We have applied woodchips liberally over much of the garden and orchard to minimize weed growth. We have set up a high efficiency, fully automatic watering system. The participant plans to utilize volunteer labor whenever possible.

Organic Systems Plan

Crop Production

All row crops have been grown from certified Organic seeds. The participant does all her own seeding in plastic trays and biodegradable pots. The plants are later transplanted into the garden. Perennial crops such as asparagus and artichoke will be purchased as starts from a certified organic producer. Berries and trees were purchased from a local, Organic producer called Trees of Antiquity. They were planted as bare root plants in the early spring.

Soil Management & Crop Rotation

We have divided the vegetable crop area into three plots to allow for a three year crop rotation. Crops will be rotated clockwise through plot 1, 2, and 3 with winter cover crops following two of the 3 years. The 3rd winter, the soil will be left fallow. See crop rotation diagram for details. In addition to crop rotation and cover cropping, compost will be used when preparing planting beds in the spring.

Pest, Disease, & Weed Management

Weeds are tilled in at the end of the rainy season to prepare the garden plots for planting. During the growing season, weeds are pulled by hand or managed with hand tools. Mulch is utilized whenever possible to decrease weed growth. A diverse planting scheme will be employed to minimize disease issues. Herbs and flowers will be inter- planted in the garden area to repel insects and pests. We will be planting chives, parsley, thyme, mint, basil, marigold, and nasturtium. Monitoring will be done through consistent presence in the garden. The participant lives on site and walks through the orchard and garden daily to visually assess the condition of the plants.

Containers

All growing occurs in the ground with the exception of potatoes and sweet potatoes. This spring we plan to build raised beds made of straw bales to grow potatoes and sweet potatoes. The raised beds will be four bales long by one bale wide and will be filled with a blend of soil and compost. Additionally, blueberries were planted on mounded soil, peat moss, and compost to increase drainage and acidity.

Irrigation

The water system is made up of several different zones on two automatic watering timers. The orchard is broken up into 3 different watering zones on separate valves. The garden area is divided into 9 different watering zones on separate valves. Each zone can be programmed to have unique watering schedules. This allows each garden and orchard area a tailored schedule that benefits the specific crops planted. The main water supply is filtered by a 2" Arkal Dual Filter line filter. This removes sediments and keeps all valves working properly. The orchard and perennial crops utilize ½ inch poly irrigation tubing and Rainbird pressure compensating drip emitters to deliver accurate watering where needed. In the garden plots, irrigation tape is utilized.

Materials

In addition to the materials mentioned already, we used metal T-stakes to stake fruit trees, berries, peas, and beans. We built a hoop house with metal steel pipe and plastic. The participant utilized biodegradable jute string to create a climbing structure for peas and beans.

Greenhouse

We found that the winds on this site are too strong for the plastic of the hoop house. We built one hoop house that survived one a year due to high winds ripping the plastic. We removed the torn plastic and repurposed it into a weed tarp. The metal hoops of the hoop house will be covered with a shade cloth this year for rearing larger potted starts. Eventually, we plan to build a solid, wood and plexiglass greenhouse for the participant to start seeds in.

Compost

We have a designated area for creating compost. Thus far, we have been piling our plant trimmings, weeds, and dead plants into a large hot compost pile and turning it with the tractor. We plan to build a vermicompost system as well. Additionally, we plan to purchase organic mushroom compost and certified organic green waste compost.

Practice Schedule

Conservation Crop Rotation

The garden area is divided into 3 plots labeled 1, 2, and 3. The plantings in these three plots will be rotated each year with nitrogen fixing cover crops grown in the winter after 2 out of the 3 plantings. See crop rotation detail for more info.

Cover Crop

Cover crops will be used in the garden area as detailed above as well as in the terraced orchard area. In the orchard, cover crops will be seeded each winter on the flat part of each terrace. This will help to reduce erosion, provide forage for pollinators, increase water holding capacity of the soil, and improve soil health over time. Cover crops will be mowed at the end of spring rather than tilled to preserve soil microbial health and reduce the potential for erosion.

Hedgerow Planting

Native perennial plants, shrubs, and trees will be planted to provide year round cover, pollinator forage material, habitat, and carbon sequestration.

Herbaceous Wind Barriers

Perennial, evergreen trees planted in a row with minimal spacing provide a physical barrier that helps to reduce wind speeds for the garden area as well as the home.

Mulching

A four inch thick layer of wood chips covers the soil along perennial plantings. This helps to protect drip lines, hold in moisture, reduce weeds, and provide long term organic matter. Woodchip mulch along tractor roads and paths in the garden serves to reduce the growth of weeds and create a defined path for walking and driving the tractor.

Terrace

The sloped section of the farm has been terraced to create eleven flat areas for growing fruit trees. These flat areas can be managed with a small tractor. By orienting the tree rows across the slope, we are slowing the movement of surface water downslope thus reducing erosion and encouraging infiltration.

Tract number	PLU(Field)#	Practice code	Practice Name	Planned Amt	Practice Units	Planned Date
1000	1, 2, 3	328	Conservation Crop Rotation	.33	Ac.	April 2024 and each year after
1000	1, 2, 3, 4	340	Cover Crop	.58	Ac.	December 2022, January 2024, each year after
1000	5, 7	422	Hedgerow Planting	.2	Ac.	February 2025
1000	6, 8	603	Herbaceous Wind Barriers	.1	Ac.	October 2023
1000	1, 2, 3, 4, 6	484	Mulching	.13	Ac.	February 2024
1000	4	600	Terrace	.5	Ac.	August 2022