

*Growing Table Grapes
In Subtropical Hawaii*



Using Organic Practices
Gerry Herbert & Nancy Redfeather

Growing Table Grapes in Subtropical Hawaii Using Organic Practices

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Growing Table Grapes in Subtropical Hawaii Using Organic Practices
by Gerry Herbert and Nancy Redfeather

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Cover design by Lyn Howe

Photographs by Nancy Redfeather, Melissa Emond, and Shawn Linehan

Editor – Nancy Redfeather

Formatted by Robert Harrison

Published in USA by Xpress Reprographics & Printing

ISBN 979-8-9862762-2-9

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“It is not the most intellectual of the species that survives; it is not the strongest that survives; but the species that survives is the one that is able best to adapt and adjust to the changing environment in which it finds itself.”

– Charles Darwin

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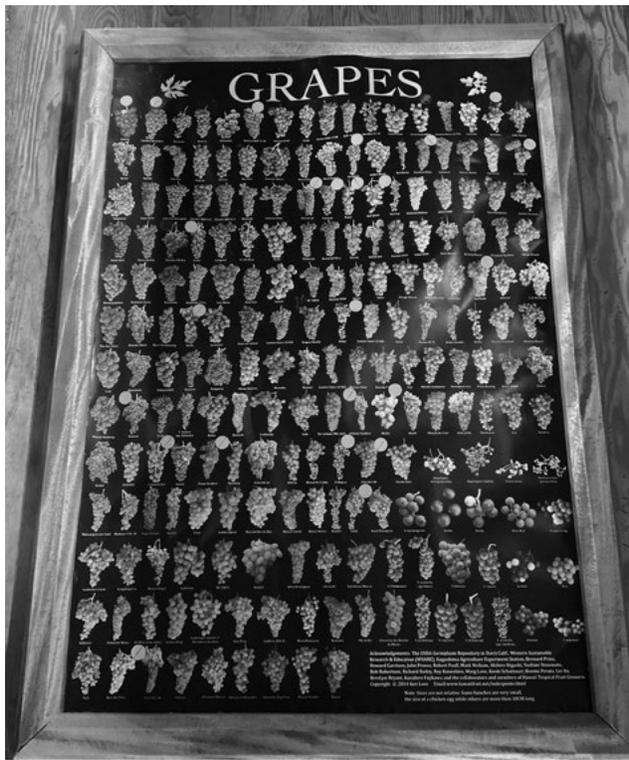
Introduction



Humans have been eating and cultivating grape varieties for thousands of years. Grapes have provided an essential food world-wide producing wine, juices, fresh and dried fruit, all with a high nutritional profile making it a super-food. Hawaii is the most isolated Island chain in the world. We are 90%+ dependent on outside food sources creating extreme vulnerability which has not been fully addressed. We know that twentieth century industrial systems of agriculture are no longer viable in today's changing world and climate. Global warming, a world pandemic, forced migrations, societal change, economic downturns, and unsustainable food systems are driving this needed change. Hawaii needs more locally grown, sustainable and nutritious food sources and we think grapes could be part of that direction. The goal of our Western SARE research and education project was to first research then introduce and share a new locally grown nutritious food for Hawaii using sustainable/organic growing practices.

Did you know that America is the “country of origin” of 6 of the 8 *Vitis* species of wild grapes? There were many native grape species growing in North America long before there were any peoples living there. Some of these varieties may sound more familiar than others: *rotundifolia* (muscadine), *aestivalis* (summer grape), *riparia* (frost grape), *labrusca* (fox grape), *mustangensis* (Mustang grape), and *rupestris* (sand grape). Some of these wild species are found in every state in the US *except* Hawaii and Alaska. Over the last hundred years some interest has been given to this rowdy and uncouth bunch of American species. While these grape varieties are not widely cultivated or commercialized as the *vinifera* varieties, they show potential for crossing with European grapes to make enjoyable juices, wines, table grapes, and raisins and deserve to be recognized.

Worldwide, there are 10,000-20,000 grape varieties growing under very different climatic conditions. From this large group, there are only some varieties that would grow well in the subtropics.



So many different varieties of grapes! Poster created by the Hawaii Tropical Fruit Growers Association, 2014

My research tells me, there are grape varieties that can grow well and taste good in Hawaii, so finding the right ones with parent lines that have some adaptation to the subtropics is essential.

The wild parent lines I chose to work with are Shuttleworthii from Southern Florida, Simpsonii from Southern Florida, and Smalliana Central and Southern Florida. These varieties offer an introduction to the subtropics. Wild grape varieties must be pollinated because their flowers are either all male or all female. 75% of wild grapes are male and 25% are female so that creates a lot of crossing possibilities. Almost all commercial grapes are crosses and *all* have perfect flowers meaning they have both male & female parts.

When grape explorer and breeder Joseph Fennell was in the Everglades looking for wild grapes, those “little gems” that could be used for crossing with other types of edible grapes, he would look for grapes that were a little larger and a little sweeter than most wild grapes indicating they had crossed with another variety. The United States has only a small amount of subtropical acreage so little research has been devoted to this unique environment and is wide open for adding new information for growers living in subtropical ecosystems like Hawaii. There is a link to Gerry’s detailed research design in the Appendix.

There are many micro-climates found in the Hawaiian Islands. This diverse ecosystem creates endless possibilities for growing grapes. Over the past seven years we have discovered the potential for growing grapes in our micro-climate. Vetting grape varieties for *your* micro-climate will be essential and we will do our best to share what we have learned. Our intent for this research is to grow table grapes, grapes for juice and for raisins. Our trials have not been for wine grapes, however some of these varieties could be made into wine. Worldwide, there are many subtropical regions that grow grapes. Procuring scion wood from those regions and continuing trials would expand the foundation of subtropical grape varieties for Hawaii’s growers.

Our research focus was to identify varieties and practices that are focused on the home garden and small growers. We are not grape experts, rather we are enthusiastic amateurs dedicated to growing vigorous, healthy, tasty grape varieties in Hawaii.

Chapter 1 – Getting Started



We began our grape research project in 2015 on our small farm at the 1,450 ft. level in the mauka Kona area of Hawaii Island. We had been growing other crops here since 1999 so the soil had varying amounts of fertility. Since 2015, we have planted fifty eight varieties of grapes we thought had potential to grow here. To choose what had potential, Gerry began researching grape varieties and discovered that because we live in the subtropics, and most grape varieties have been bred to grow in temperate climates, we had to look at this differently.

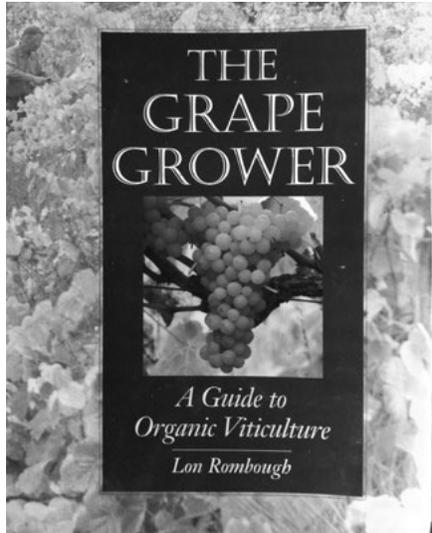
Grapes bred for temperate or Mediterranean climates, just won't do well here. That fact has been proven many times in previous grape research projects in Hawaii and in selections grown at our wineries. We don't get a freeze that helps the grape drop their leaves and enter hibernation, and we don't have a long day/short day cycle of light. We have a short day light cycle that requires growing varieties that have some subtropical parent genetics and we also have different pest and disease pressures.

Through Gerry's reading in books and on the internet, he discovered independent grape researchers and University breeders who had also been looking at this unique combination of factors, mostly in Florida. There wasn't a lot of research on this because the subtropical area in the United States is so small. But he did discover Joseph Fennell an independent grape breeder, that had focused his work on the subtropics. He researched the parents of his grape lines and then knew what to look for when ordering varieties for his trials from the University of California Davis Grape Repository one of the National Clonal Germplasm Repositories.

On Hawaii Island we have many microclimates and what may work well here may not work in your microclimate. Our weather in Kona has an opposite weather pattern than the other Hawaiian Islands. We have a dry winter and wet summer while the rest of the Hawaiian Islands have wet winters and dry summers. Our goal in this booklet is to lay out what you should be thinking about and observing for your unique area. You will be doing your own

trials and vetting varieties for your area. In our favor is the fact that grapes have the ability to acclimatize themselves to many different environments.

To be successful at growing grapes, there are a lot of factors to consider, more than we can explain in this little booklet. We would recommend that if you are interested in getting started, that you invest in a good book that explains the details of all aspects of growing grapes.



“The Grape Grower: A Guide to Organic Viticulture” by Lon Rombough

The book we have used over many years and highly recommend is called “The Grape Grower: A Guide to Organic Viticulture” by Lon Rombough. Lon grew grapes for a lifetime in the Willamette Valley, Oregon. He passed away in 2012 and left an invaluable legacy of grape growing information. See Appendix. We found this book to have sound practical knowledge and advice for any level of grape grower. Also, his second book “The Bountiful Grape: Using Everything the Grape Produces” is full of essential culinary information.

If you are interested in growing one or more grape varieties for your home garden or farm, here is a list of things to consider before you begin.

- What is the weather like in your area? Do you live in a region of Hawaii that gets constant rain, or do you have wet/dry seasons? What is your elevation and daily temperature range? Grapes need sunshine and warmth.
- Do you have strong trade winds that would require some kind of wind barrier?
- What is your soil like? Does it drain well? Is it very rocky? Do plants grow well in your garden or farm?
- Is your garden or farm oriented to sun most of the day?
- What kind of trellis design will you be using knowing that there are many ways to construct a structure that will be long lasting.

We asked ourselves these same questions before we began.

The weather here at Kawanui Farm over the past 5 years has been “variable.” Before 2018 we had a consistent wet/dry season each year, wet summers and dry winters. But in 2018 we had a fairly dry year with a three month volcanic eruption with extreme vog, and many grape leaves turned brown and fell off the vines. Then in 2019-2021 we had close to 100” of rain each year (instead of our average 40”) with mostly cold and cloudy days. Grapes love and need the sun. Some varieties died, and others survived but didn’t thrive. Over those 2+ very rainy years we increased our yearly pruning of the vines from 75% to 98% during the

winter cut-back because of excess leaf and vine growth. Because of the high rainfall, the summer fruit production was low and the taste of those that did produce was poor. *However* in 2022, the Kona area returned to its more familiar wet/dry season and the grapes responded well with good production and taste in the summer 2022 harvest.

If you live in a year-round wet area, that is also cold, grapes might not be the best choice for you.

We have five small vineyards positioned in different areas of the farm that receive different amounts of sunlight. The vineyards that don't receive full sun in the winter and are in a more shaded area, are a little slower to bud out in the spring but the winter shade supports their hibernation period so it seems to even out. We don't have any wind challenges in Kona, and we have a volcanic ash soil that drains well and responds well to the addition of organic matter and mulch.

As we discovered over the past seven years, the grapes will tell you what you need to know. Your job is to observe, learn, and continue your research.



Two of five Vineyards at Kawanui Farm

Chapter 2 – Building Your Trellis



All grapes need some kind of support because they are vines and should not grow on the ground. In the wild, grapes grow up trees, however we would not recommend that because they become difficult to pick and prune. For best production, grapes need to be pruned every year and you need to have easy access to the vines to do that. Pruned vines produce more grapes in the summer season. Here are a few ideas you can use to create your grape trellis knowing that there are many ways to do this from simple to complex.

The trellis system you choose to create depends on a few factors. How many varieties do you want to grow, one or many? How much space do you have for your vines? Are you going to grow them along an existing fence, or do you want to put in posts with a single wire, or a t-bar with 3 wires. If you decide to grow on a fence, make sure you have easy access to both sides of the fence.

For our trellis design, we chose the Modified Geneva Double Curtain. (See Appendix) The trellis is used to keep grapes off the ground, and at a height that is easier to work with



Modified Geneva Double Curtain trellis

and prune. Grapes need to be pruned yearly for best fruit production. Gerry usually prunes in February toward the end of winter. But climate change is altering our practices. We must be willing to constantly observe the grapes and react to what they need. This year 2022 as we are back to a dry sunny winter cycle and some of our varieties are budding out a month earlier. Because some of the grapes are beginning to bud in January we will be cutting them back earlier than usual. Gerry will keep an eye on the rest of the varieties and if they show early budding he will prune them also. In the temperate zone, pruning is done before you see any budding, but in the subtropics you will need to modify these practices. When he sees a variety

that is budding out very early, like in December, he will snip off that stem with his clippers encouraging the vine to wait a bit longer.

In the subtropics, some grape varieties grow 10 feet and others up to 34 feet long in a single season. Gerry is learning which varieties need more room and which ones can be grown in a more limited space. In the “modified” Geneva Double Curtain System he has developed for the vineyards, two long wires are used for training on each side of the T-bar. The T-Bar is made from old growth redwood, the wire is galvanized 12 or 14 gauge. This “modified” system adds redwood slats and/or other wires between the two long wires to add more room and stability. Then any of the four types of pruning can be accomplished in a much smaller area which is much more efficient. The four types of pruning are long arm, medium arm, short arm and spur pruning.



*Gerry showing possible vine growth in one season.
Vines de-leaved for winter dormancy creating mulch.*



T-bar with two main arms

The vine grows up the post of the T-Bar to just below the top of the T. Then the top two buds are encouraged to grow one to the right and one to the left. When they are long enough they are tied on to the T. These are the main 2 arms that will grow out to the two wires. When the vine reaches the wire, again, two buds are encouraged to go one to the left and one to the right.

If this sounds complex, it was one of the solutions to growing grapes in the subtropics. It's possible this system could also increase fruit production in a limited space. Time will tell.

I make adjustments as the years go on because the grapes are teaching me what they need for best growth.

Chapter 3 – Starting Grapes from Scion Wood



The first step in growing grapes is rooting out scions of a particular variety. A *scion* is a piece of last year's woody vine that has 4 buds. Two of the buds will be planted below the soil line and the other two above as they will become the vine. There are a few other ways to create new grape plants including growing from seed, air-layering from green stems in the summer, laying a stem along a trench in the soil, but we will be concentrating in this booklet on starting a grape plant from a scion.

There are three different places I plant scions.

I plant my scion wood in three different places to increase success. I plant some of each



Planting out scions in one-gallon pots

variety directly into the soil of the vineyard because I discovered that *if* they root there, you are a year ahead in the growth of the vine. As back up, however, I always plant other scions into one gallon black pots in good soil with compost. When you plant directly into the soil or into your one-gallon pot, when you see the two buds above the soil begin to grow, look for the fastest grower. That stem will be gently tied either to a small upright stick in your pot, or to a vineyard pole that will keep it from being broken. The fastest grower is usually the top bud (apical dominance). If the top bud looks strong, then I nip off the growing point of the second bud leaving it there just in case something happens to the top shoot. I eventually remove the bottom bud when I see for sure that the top bud is growing well. I grow my potted scions in the greenhouse under shade cloth until I see roots coming through the bottom holes. Then I

prepare a hole in the vineyard and plant them out with more compost mixed into the soil. You can plant these rooted scions out anytime from March to June.

To back all this up, just in case, I plant more scions about 10 inches apart in a special area of the garden that has fertile soil. Using these different planting techniques gives me more information on which ones are more easily rooted and which rooting technique is best for which variety

When the plant is well rooted I will transplant it into the vineyard and tie it to the post.

When you prune your vines during the last part of winter when the vines start to bud, you will use these woody cuttings (scions) to make more grapes. When I am making these cuts I am looking for a portion of the vine that is approximately $\frac{1}{4}$ - $\frac{3}{8}$ " wide. I don't make scions from skinny or fat parts of the vine, and I make my cuttings as close to the arm on the wire as possible. Each scion should have four buds. You need to keep track of the direction the buds are pointing, so that when you plant, the bottom 2 buds will go under the soil and the top two above the soil. The scions should be approximately eight inches long.

I make my first cut straight across just below the first bud that will become a root bud, count up 3 more buds, and make the top cut at a 45 degree angle pointing up. That way you will always know the direction the scion should be planted; Flat side down, pointed side up, two buds below the soil, two buds above the soil.



Gerry tagging scions with variety name

Remember, during these early stages, the vines are tender and can break off. I like to use sisal twine to tie up the young vines to the pole or upper wires, because it is softer and in a year or so it will fall off by itself. By then it will no longer be needed.

Chapter 4 – Using Organic Soil Building Practices in the Vineyard



For the past 50 years, I have used organic practices, first on my 20 acre farm in Mendocino, and then on our one acre farm in Kona. I attended and graduated from the University of California Davis in Soil Science and Vitaculture in the 1990s and was exposed to many different types of agricultural practices. Because my focus at that time was on restoration of land, I knew that required the use of organic practices to build soil health. I have learned a lot about building soil health in Hawaii over the past twenty five years as tropical soils and systems work differently than temperate systems. The twelve month growing season, no freezes, ash soils, and hard rains call for organic practices that will protect the soil and build fertility.

In the subtropics, compost adds organic matter of the highest quality, a wide range of minerals, and soil microorganisms to the planting areas helping vines to find what they need for optimum growth and health.



One of many compost piles on the farm

On our farm, we usually have five or six compost piles “curing” in various stages of transformation at any one time. We practice cold composting, as nature in the wild would do, and find that turning the piles is unnecessary. Compost can be finished and ready to use in 3-4 months. We add green and brown plant material, weeds, kitchen scraps, wild fish and chicken scraps, and keep larger woody branches out of the pile. Keeping the piles slightly moist at all times hastens the decomposition. Most of the wood is then processed through the home fireplace and the ash is used lightly on all the beds, and around the trees in the orchard. Over the past twenty

years we have used few outside inputs which has helped increase on-farm nutrient recycling, and reduce invasive species. On Kawanui Farm, instead of using soil tests, we observe plant health, and let the plants show us what they need.

Besides compost we use wood ash, bone ash, and shell ash all run through our home fireplace. These three amendments are used sparingly and worked into the top six inches of soil before planting to add a wide variety of minerals in a form that plant roots like and plants need.

Mulching soil in the subtropics is absolutely necessary. Organic matter in subtropical soils is depleted three times faster than in temperate soils, due to constant warmth and consistent rainfall. Our five vineyards have soils covered with a wide range of organic material, including leaves, grass, and soft stems. As the grapes fill out their leaves and shade the soil, the amount of mulch necessary to protect soil health and retain soil moisture decreases. Mulch protects the soil in many ways, decreases soil temperature under the subtropical sun, helps to preserve organic matter in the soil, decreases and can eliminate weeding, increases soil carbon, increases capacity of soil to retain moisture, and becomes another compost source to feed soil microorganisms.



Leaf mulch protecting and feeding soil of vineyard

The vineyards are not on a watering system.

They are watered by a hose when necessary and I always water them deeply when they come out of hibernation in the late winter. In our summer wet season the grapes can receive rainfall almost daily. If you live in other areas of the State you will most likely have a dry summer that will be advantageous for grape flowering, fruit growth, and sweetness. But again, environmental conditions in your areas will contribute to the vetting process.

Out of fifty-eight varieties trialed, twelve have survived these extremes, are growing well, producing tasty grapes, and are looking very promising.

Chapter 5 – Training the Grapevines



Training grapevines is necessary to maximize sunlight entry into the canopy, increase productivity, and to facilitate harvesting. Many grape varieties respond better to specific training styles and I am continuing to gather specific information by variety. There are many ways to train a grapevine depending on many different factors including variety and environmental conditions. When the winter dormancy cycle has completed (see Chapter 6) the grapevines will show you by beginning to bud out along last year's wood. In 2022, Spring arrived early around February 1st and the new budding cycle continued into April. This will vary due to your particular micro-climate.

As the grapes bud out and begin to grow, there is a lot of information that will become available to you as you observe their growth patterns. Here are a few examples:



Variety 13B showing vigorous growth in spring

The variety 13B was the earliest to bud this year, and has vigorously burst forth in its third year in the vineyard. Early and vigorous spring growers like 13B will be the first variety I train this year. Because I am using the modified Geneva Double Curtain trellis system, after pruning when new growth appears, I will tie each vine down to the wire with sisal twine as soon as they are long enough. You must tie the vine when it is green and flexible. If you wait until it is brown, it will be too stiff and could break.

Remember that here in Hawaii because we have a eight to nine month growing season, some varieties can grow up to twenty-five feet or more in a single season. There are four techniques I have been using to prune the vines that you will learn about in Chapter 6, and you can apply that information here. Gerry has made a few videos showing these training techniques. See Appendix for video links.

I developed another practice that is important for the subtropics. Once the plants have leafed out take time to remove some of the leaves that are under the top canopy, ones that are not receiving any sun. Good flow of air through the vine is important to cut down on diseases that could form in any warm/wet climate. This also encourages dappled sunlight to shine down onto the grape clusters as many will form under the leaf canopy, and this will produce a sweeter grape.

Another routine maintenance practice is that whenever the vines grow down and touch the ground, I cut them off at the soil level and use them as mulch. Subtropical grapes have a tendency to be very vigorous growers and grape production is **not** dependent on length of the vines. Nipping off those long vines helps keep the area open. These two practices create more space and room for the clusters to form properly.

Next, as the grape clusters form, you need to select the best looking ones, and clip off any small clusters. As a grower, you need to have enough large clusters for good production but not too many as that will stress the vine, especially in the early years. I also pinch off tiny grapes that are on the larger clusters. This encourages the larger grapes on each cluster to form properly.



Gerry pinching off small grapes from bunch

As the grapes ripen they will begin to change color. This is called “veraison.” At this point I begin to bag clusters to discourage birds from pecking at the grapes. I make little mesh bags out a material that is used for curing onions. It is a long mesh bag that can be cut into pieces and I tie off one end with a small piece of a flexible aluminum wire and the other end with a small piece of Velcro that is used in the horticulture industry. This way I can see into the bag and easily open the bag to check the ripeness of the grape cluster. Grape clusters



Bagging grapes prevents bird loss

are ripe when the grapes begin to get softer and of course you taste one and it tastes sweet! Also, the small stem holding the grapes to the vine will turn brown. This indicates that the nutrient flow from the vine is diminishing.

I have tried to select varieties that will come in over a long period of time from June through September each year. It is better for the small producer to have fruit production coming in over a longer period of time. That way the grapes can be processed in various ways and the grower can enjoy the fruit for months.

This summer (June-September) was our first large harvest from our oldest varieties. Five of our oldest varieties now seven years old are beginning to show us the quantity and quality of production that can happen. Some of our varieties are newer, and are only producing a few small clusters in their first year of production.

This is what vetting means, we are looking for vines that are tough and hardy with grapes that have an excellent taste that can be eaten out of hand, made into juice, or dried into raisins. This takes time. Be patient!

Vinifera varieties from Europe which are traditionally made into wine do not grow well in the subtropics, at least I have not found any varieties that grow well in this climate and day length. These varieties have a high brix level but are virtually tasteless whereas table or bunch grape varieties each have their own unique taste that shines through when eaten out of hand, made into juice, or into raisins.

In 2022 we trialed six new vinifera table grape varieties that grow in India. Out of those six varieties only one has survived.

We invite you to be part of this grand experiment, a work in progress, to first identify which varieties want to grow in your micro-climate, and then identifying what type of pruning is best, how does the variety want to be trained, and how does the fruit taste. We will all continue to gather and share information as the years progress. Some of us live on the coast and others live high on the mountain and everywhere in between! There are so many micro-climates within those elevations.

Remember, Lon Rombough says that the actual taste of the grape will come 6-8 years after planting and then you will enjoy that for the next 100 years!



Birds love grapes and bagging protects clusters

Chapter 6 – Pruning the Vineyard



Grape vines need yearly pruning for a few reasons. One is to get scion wood to plant out that will increase the number of plants in your vineyard and the other is to maximize the number of grape clusters on the vines the next summer. Vines are pruned, first to control the size and style of the vine, then to balance flowering, fruit, and vegetative growth. In past years, I have pruned at the end of February, which is the very end of the hibernation cycle. During the Fall of 2021 as the rains ceased and the weather became warmer and drier, the vines naturally lost many of their leaves, which is part of the natural grape hibernation cycle. Then, the Chinese Beetles and I removed the remaining leaves creating a dormancy period of rest for the grapes. The leaves are dropped in place creating a protective mulch. The rest cycle is important because at that time the vine puts all its energy into its roots. In spring it's ready to start the cycle again with renewed vigor.

Grapes like people need a rest and restore time of year.

Budding signals that the vines need to be pruned. This year I am seeing spring budding of a few varieties in late January 2023. However, that is a little early to prune so I will remove early buds until the first week of February. Most likely by the middle of February all varieties will be budding and will be ready to be pruned. You can watch two videos of my pruning techniques on our YouTube video page. See Appendix.



Gerry defoliating grapes in early winter

There are four ways of pruning that I am experimenting with in these trials. There is no information available on pruning for the subtropics so I am first observing each variety and making notes on how it grows looking for where it wants to set its flowers and fruit.

The first technique is called “spur pruning.” This type of pruning is used for wine grapes but can also be used for bunch grapes. Not all varieties take to spur pruning as some varieties want to produce fruit further away from the main double arm. Spur pruning cuts back most of the year’s growth on each vine, leaving only two buds per spur for the coming year’s fruit production.

The second pruning technique is called “short arm.” In this style, the plant wants to produce most of its fruit roughly three feet from the “double arm.”

The third technique is “middle arm pruning” where the plant wants to produce fruit about six feet away.

The last technique is what I call “long arm.” Here, the variety seems to want to flower and fruit even further away from the main stem.



Before: Pruning one season's growth



After: Pruning showing vine structure

I have made several videos showing grape pruning techniques see Appendix for video link. Each variety is different and is showing me the way it wants to be pruned.

Having a good pair of hand pruners, like the Felco model I use is important and easier on your hands. You want a clean cut so make sure you sharpen your tool before you begin. Once a grape variety is pruned I have a variety of uses for the vines. I cut the pruned vine first into my scion wood for planting as discussed in Chapter 3. Any woody stems left I cut in pieces as kindling to start the morning fire in the fireplace during the winter. The ash from the fireplace is recycled and lightly sprinkled into the soil adding an amazing array of available minerals. Thus, the cycle is circular and sustainable. My wife is interested in weaving a grape basket and the longer stems would work well for that craft.

Let’s review and elaborate on this important scion information. First, I cut the woody vines for scions, as grapes grow best from the older wood. I look for the best wood, not too thick or thin, and buds that are well spaced, they are not too close together or too far apart. I am looking for four buds on each scion. Two buds will be planted below the soil and the other two will become the vines. I cut the scion about eight to nine inches in length, the bottom cut is flat one quarter inch under the lowest bud, and the top cut is a forty-five

degree angle, an inch above the top bud. Next, I make a moist, but not too wet, paper towel to wrap around the bottom of the scions and place them in a plastic bag in the fridge until I am ready to plant them out. Scions can stay in the fridge like this for up to one year. Be sure to label the scions to keep varieties separate, but don't use tape as it degrades in the fridge. I use an aluminum tag, write the variety name on the label with a marker, and use copper electrical wire to bundle scions by variety.

When I am ready to plant, I plant scions of one variety in three different places; directly in the soil of the vineyard (saving a years time), in one gallon pots in my greenhouse (one to two scions per pot) and in a section of my garden. Sometimes when the scion will not root in the soil (because it was too cold or wet) then you have backups in other places, as not all scions will root. You may have other techniques for rooting woody cuttings that have been successful for you and you should try those. Experiment, experiment, experiment.

I discovered that Muscadine varieties don't root easily from scion wood. So I decided to experiment with a new technique. I dug a two inch deep trench to the next trellis starting where one long vine touched the soil, and placed the long arm of the vine in the trench removing all the leaves on the trenched arm. The last eight inches of the vine I brought up above the soil next to the new trellis and left the leaves on that part of the vine. That worked, the vine grew up the new trellis! I also tried something else. I used a long arm and let it run across the top of the soil and up into a hole in a one-gallon pot leaving leaves on the part of the vine in the pot and removing the leaves on the other side of the vine. Then I filled the pot with soil leaving about 6 inches of vine with leaves above the surface of the soil. The vine grew roots in the pot! I let that grow through the season and then cut the vine off the mother and transplanted the new vine into another vineyard. That next year it grew about 8-10 feet. Success! The Muscadine also can be grown from seed, as that variety has genetics in the seed that are close to the mother's genetics. But it takes many tries as not every seed will grow and when it does germinate it grows *very* slowly.



The Muscadine variety "Nesbitt"

So you *can* start a grape vine from seed. However, T.V. Munson says that if he plants out 1,000 seeds he would be lucky to get 5 good vines. So you can start a grape from seed, if you have lots of time.

To review; grape vines need yearly pruning for a few reasons. One is to get scion wood to plant out that will increase the number of plants in your vineyard and the other is to maximize the number of grape clusters on the vines in the next summer.

Chapter 7 – Vetting Varieties for Your Subtropical Micro-Climate



I had prior experience vetting and growing grapes on my farm in Mendocino and as a teenager in Texas. Prior to and after receiving my first plants from the Grape Repository at University of California Davis in 2018, I read everything I could find on growing grapes both in books and on the internet and I encourage you to gather information also. Although these sources can be very helpful, our main teacher will be the grape itself as you will be watching it and observing how it grows. I also encourage you to keep notes in your Log Book from the very beginning. Looking back on this information over the years is invaluable and gives one perspective and helps with decision making. (Appendix: See my log books in the Reports section on our website)

In Chapter Eight, we will discuss varieties that have grown well here, can be reproduced from scion, can withstand and thrive with the Chinese Beetle, and have a great taste. We will also share the variety names that for one reason or another did not grow well. In my opinion, taste is the most important quality followed by tough and hardy. You don't want to be growing varieties that would force you to think about spraying or have a poor quality



Subtropical wild grape varieties carry the white felting on the back of the leaf that discourages the Chinese Beetle

flavor profile. If you are a home grower, finding even one variety of grape that loves to grow where you are will give you fruit for the rest of your life and beyond. Remember grape plants can live hundreds of years.

As far as I can tell, there are no European wine grape varieties that have been bred specifically for subtropical environments. These wine varieties grow mostly in temperate zones.

There are hybrid bunch grape varieties that combine the genetics of the European grape with American grapes that can be used for juice, raisins, or eating out of hand, or even making wine or vinegar. Some of these varieties have subtropical parent genetics giving them an introduction to the subtropics.

Finding those varieties has been the focus of this research project. Possessing some subtropical genes is extremely important as it gives the grape the best chance to survive in our unique climates.

Finding the right varieties to vet will be challenging but not impossible. Here are a few ideas for obtaining bunch grape varieties that have subtropical parent genes in their lines.

1. Team up with your local Hawaii Tropical Fruit Growers Association or your local Extension Agent from University of Hawaii Manoa and together you place an order for specific varieties for research from the University of California Davis Grape Repository. These requests can be made anytime, but scion wood is only sent out once a year usually in March. Extension could theoretically grow out varieties at your local CTAHR station and become a scion repository for local growers. The Fruit Growers Association could also set up an experimental grape vineyard that eventually could supply scion wood for your Island. You can use our list in Chapter Eight of our most promising varieties to get you started.
2. There could be at least one nursery on your Island that brings in bare root grape varieties usually in January/February. You may need to research this to find the right ones and ask them to bring them in. However, these varieties will most likely be suited for temperate climates. If you live high on the mountain in Kula, Maui, Volcano or Waimea, Hawaii Island, all more temperate areas, these varieties could possibly work.
3. There is a good chance that there are grape varieties being grown on your island by grape enthusiasts! When we reached out to growers groups across the state to identify our stakeholder group two years ago, we found many people who were growing one or more varieties in their back yard. Do some investigating, ask around and see if you can find grape vines growing in your area. In the Winter when grapes are pruned, there would be the possibility of obtaining woody scions to plant out and vet in your garden or on your farm. Because they have already been growing successfully in your area, that is a jump ahead for you!
4. We will have a limited amount of scion wood available starting in 2023, and will be reaching out to our stakeholder group to identify serious growers who might want to do the basic vetting for your growing area.
5. University of California Davis also keeps some tropical and subtropical varieties from other areas of the world that could also possibly work. This would take further investigation.

In 2022 we are beginning to vet some varieties from India, but this will take another 3 years at the minimum to know if they will work.

You must be creative and determined in order to establish a new fruit for Hawaii's table. Grapes are a beautiful, nutritious and important fruit that complements the banquet table of fruits that can be grown here.



Chapter 8 – A Summary of the Best Varieties from our Trials 2015-2023



Starting in 2015, because I was a member of the Hawaii Tropical Fruit Growers Association, I became aware of the “Growing Grapes in Hawaii” a SARE Farmer Rancher initiative that Ken Love was conducting. I was able to get a few varieties from him and started with those. The varieties I started with were Caribe, Nesbitt, Seminole, Everglade F-272, and Tamiami. There were also many varieties that were planted that didn’t work for one reason or another. This list is included at the end of this chapter.

Over the past seven years I continued my own research and ordered new varieties from the University of California Davis Grape Repository in 2018 and 2020. The new varieties I started from scion wood in 2018 had various problems including insect damage, rooting challenges, an intense volcanic eruption, and difficult weather conditions. But those are real life conditions and I wanted to find varieties that would be tough and hardy. The 2018 varieties were important because they taught me many “grape lessons” I needed to learn, so that when I reordered new and different varieties in 2020, I was able to make better choices based on what I had learned, my previous research, and what I could glean about the variety from the UC Davis site and the internet.



Grape varieties have different leaf shapes and colors

I was able to obtain another six new vinifera table grape varieties from India that have come to me through a grape grower in South Kona. India and Hawaii Island share a similar sub-tropical latitude. There are other tropical areas of the world that grow grapes, but Hawaii

is a subtropical region with its unique weather patterns and growing conditions and this is the focus of this research project.

Most Promising Varieties as of Summer 2022

Meyer 6-7: (UC Davis 2020) – Much is unknown about this variety, but what is known is that the parents are TV Munson’s “Carmen” and two “Wild Mustang Grapes” one from Northern Texas and the other from Southern Texas, which is borderline sub-tropical. I had also read that “Carmen” was a good raisin variety that could grow on the coast of Texas. I observed that it was not bothered too much by Chinese Beetle, and has grown well here. However, only one of the original six scions grew. Later I was able to start more from my own scion wood and I have two more growing in the nursery, but it is a *challenging* variety to start. This is its third year of growth and had six small clusters. We tasted the first fruit recently and we were pleasantly surprised at the sweet and sprightly flavor, thin skin, small seed and ample juice. Excellent potential.

Edna x Simpsoni: (UC Davis 2020) – “Edna” is a TV Munson variety that will not grow here, but someone crossed it with Simpsoni a wild grape from Florida giving it a subtropical introduction. The TV Munson Memorial Vineyard in Texas houses 60 original Munson varieties. In their publication, they describe Edna. “This is one of the handsomest grapes that we have. Large clusters of white (green) berries of best quality.” Edna is a hybrid of Armlong crossed with Malaga has the Muscat flavor that is so good but this variety is superior owing to the peculiar combinations. The “handsome” comment could possibly owe to its beautiful delicate pink leaves when young turning to green later. It is a vigorous grower that can outrun the Chinese Beetle but currently only two years old so taste still unknown. Great potential because of its family line and growth habits that we have observed. In its first year it hardly grew but in its second year it took off! Some vines need a probationary period giving them the benefit of the doubt.



Our vineyards have twelve varieties of grapes

Largo: (UC Davis 2020) – Largo is a bunch grape developed in the 1940s in Florida. The parents are Shuttleworthii x Rufomentosa, two wild grapes and Rufomentosa x with Ribier: According to Joseph Fennell, the two wild grapes grew out of a shell midden that he found in Southern Florida. “Ribier” whose parents were Bellino x Lady Downess were two of the best old black bunch grapes from France. Last year the vine was devastated by the Chinese Beetle but this year it has made a comeback. The subtropical introduction of Shuttleworthii is an asset. The Largo was not old enough to produce fruit this year. There is potential here.

Florida 13-B-5: Probably a grape that came from a University of Florida cross as usually their crosses are numbered and only given a name when they are commercialized. The parents of 13-B are Shuttleworthii x Alden. Remember Shuttleworthii is a wild grape from the tip of South Florida and the best “introduction” to the subtropics. Alden is a cross of Ontario x Grosse Guillaume (muscat) that came from the Cornell Breeding Station in Geneva, New York. 13-B is our most vigorous grower and this is its third year. The leaf has white “felting” on the underside which discourages Chinese Beetle attack. We have five plants of different ages in various vineyards and all are showing good potential. This summer for the first time we were able to taste twenty three small clusters which seems amazing considering it’s only three years old. The grape had a thin skin, small seed, was juicy, and had a neutral taste that will certainly improve with time. Good potential.

Florida BD 7-75: This variety is also from the University of Florida. The parents are Shuttleworthii x Lakemont x Carolina Black Rose. Lakemont is a seedless grape bred at the Cornell Station and according to Lon Rombaugh it is his favorite grape to freeze. Carolina Black Rose is a muscadine grape crossed with Black Rose a California bunch Grape developed in 1941. This is its third year of growth and we had only one bunch which isn’t unusual. We were able to taste only a few grapes but those had a thin skin, a small seed and were black in color, all are good qualities. The flavor profile will develop over time and we are expecting great things. The leaf has white felting on the underside which is a quality disliked by the Chinese Beetle.

Florida BN-852: In 2018 I ordered sixteen varieties from the UC Davis Grape Repository and this was the only variety that has survived and thrived. This variety has three wild grapes in its parentage (Simpsonii, Aestivalis, and Smalliana) all from Florida and the South, crossed with Lakemont, Paragon, Diamond, and Ontario all Labrusca type grapes that are typically grown in the North and have the Concord taste. Other parents are the Golden Muscat, Chaouch, Aurelia, and Vallard Blanc (a cross of 9 different French grapes, so you get the picture as how complex parent lines can get!). Good growth, has some white felting, and in its fifth year, there are fifty four large clusters of black grapes (after thinning) on the vine. Seems to have great potential. The pressed juice is green in color which is very unusual. It has a sweet delicate taste and made an excellent raisin.

Tamiami: This variety was developed by Joseph Fennell an independent grape breeder in Southern Florida in the 1930s & 40s. Its parents are Shuttleworthii x Smalliana x Malaga. Malaga is an ancient vinefera grape from Southern Spain. Because of the subtropical introduction from Shuttleworthii and Smalliana, it has become one of our best growing and producing grapes. We currently have four vines, the oldest vine is now 7 years old. It grows easily from scion wood. It has very good production of small black grapes and a small seed. In 2022 there were one hundred and thirty two clusters on 4 plants. The

Tamiami was our strongest producer this year, and produced an excellent raisin. The juice was sweet but does not have a unique flavor, but we think it could make an excellent wine. Excellent future potential!

Everglade F-272: Another Joseph Fennell variety with parents unknown. It looks like one of the parents is wild Shuttlesworthii (from the Everglades) because of the white felting on the underside of the leaf. Fennell never wrote a book, only some of his reports are still available, and he was not part of the University of Florida system so there is much about his breeding work that is unknown. A good grower and does well with a 98% cut back in February. Small amount of fruit production in Summer 2022 but we were able to get some beautiful dark burgundy juice and some delicious raisins.

Seminole: A Joseph Fennell grape whose parents are Shuttlesworthii x Rufotomentosa. Rufotomentosa's parents are a wild Texas Mustang Grape called Candicans x Rommel one of T.V. Munson's favorite grapes. Seminole, a black table grape, was one of his later experiments that we don't know much about. The oldest was planted in 2017, a very vigorous grower, repels Chinese Beetle (Shuttlesworthii), and in 2022 we have eighteen large good quality clusters. The Seminole is a larger grape, but has a large seed also, not good for raisins, more testing next year needed. Has potential.

Nesbitt: A Muscadine table grape (*vitis rotundifolia*) bred by W.B. Nesbitt who worked in North Carolina, Georgia, and Florida. Its parents are Fry x Cowart. Ripens over a period of 4-5 weeks which is good for the home producer. Makes a sweet and complex medium pink juice (16 brix) *Brix* is a measure of soluble solids content in *grapes*, mostly as sucrose, using a refractometer and expressed in degrees. We have 4 vines each on their own pedestal. Muscadine grapes can be started using various methods; Air-layer, trench method, scion cuttings in a mist house, or from seed. The vine has small delicate leaves with a jagged edge and many small clusters with large grape size. It has good disease resistance and a Concord taste. The Nesbitt is best used for juice or wine as it has an acceptable brix level. The taste is sweet and fruity with no after taste. Because it is a Muscadine it is not a good eating grape. We also made jelly from it that had an excellent taste. Highly recommended for the Home Garden. Possible future research would include other Muscadine grape varieties from Southern Florida.

Waimea Isabella: Starting in 2015, I found five different Isabella grapevines from various regions of Hawaii Island and one from UC Davis and grew them out. The one that did the best came from Waimea. The Isabella has a long history in Hawaii No one knows for sure, but the variety could have come as early as the 1790s. Grapes can live hundreds of years so it's possible there are still vines here today. The parent lines are unknown, although there is *much* speculation. The grape is a tough and hardy grower that does well in many different climatic areas, resistant to Chinese Beetle, makes a decent juice if *very* ripe, has a thick skin with bitter tannins and a large seed. The Isabella comes in over a month, and all grapes on

the cluster do not ripen at once. Later in the season the grapes were a bit sweeter than at the beginning of the harvest. Easy to grow. A good variety for the home garden.

Caribe: Caribe is a Fennell grape whose parents are Fairchild x Tropico. Caribe is a black tough and hardy table grape from Florida. All Fennell grapes have wild subtropical parents that have been introduced into the varieties he developed. Two years ago I cut the grape at the bottom of the stem, after reading about this advice from a grower. Luckily I had a few scions that I had started because the grape never recovered. I replaced it with another plant that is now only 2 years old and although it has vigorous growth I have not tasted the grape yet.

All these varieties above showed no disease, and the only pest observed was the Chinese Beetle.

New and Promising Varieties shared from Kona Growers

Southern Home: This variety was shared with us from another “grape enthusiast” in South Kona. I had been looking for this one for a few years as I had twice tried to get it from UC Davis. Joseph Fennell is the breeder. The parents have two rotundafolias, two muscadines, two simponii from Florida, and a grape from Southern Mexico named Popenoei or Toto-loche another muscadine grape. These were crossed with the Black Morocco. It has complex parent lines, but it has one wild subtropical grape (simpsoni) that gives it an introduction to Hawaii. I received one small plant that is now in one of the main vineyards. Another variety to look for is called Southern Jewel.

Indian Vinifera (Bunch Grape) Varieties: The following varieties came from our grower friend in South Kona, and are all table grape varieties that are common in the Indian subtropics. They all came from UC Davis. We contacted the National Research Centre for Grapes in India, and were told that they did not have any parent information for these varieties. But since they all grow in the subtropical regions of India, they are worth trialing. I started them from scion wood, and this is their first year. At this point it looks like Malta Seedless is the only survivor. Chinese Beetles loved these varieties. This shows me that subtropical varieties without a wild parent in the genetics may not work. Wildness confers diversity.

Bhokari	Bhokri
Fakdi	Kandhair
Kali Sahebi	Black Corinth
Royal	Malta Seedless

Here is a list of grape varieties that were tried but did not grow well here and were removed. Grapes that are numbered are from a University and have not received a name because they are experimental.

Grew out five Isabella from five different regions on Hawaii Island, and took out four of them that did not grow or produce well. Kept one.	Florida CA 4-72
Dracut Amber	Florida CA 8-15
Florida 15B-23	Florida CD 4-22
Kyoho	Florida A 4-23
Dunstan X73-26	Dunstan Demko
Requa	El Bejuco
Zhender 70-8-1	Salamanada
Cottage	Cloeta
Carolina Black Rose	Mericadle
Florida CN1-90	Volney
Honeydew	Wapanuka
Excelsior White	Miss Blue
Daytona	Fairchild
Florilush	Flame Seedless
Conquistador	Fennell 3-way hybrid
Blue Lake	Lynn's Grape from Kaloko
Orlando Seedless	Four different Isabella varieties
Herbemont	An unnamed variety from Hawaii Tropical Fruit Growers
Florida AN 2-36	Dunstan DRX-73-26
Florida BN 6-85	Taylor
Florida W 1521	Seven Indian varieties (listed above)

Chapter 9 – The Summer Harvest of 2022 / Culinary Uses and Nutritional Benefits



The summer of 2022 was the first year that the vines set a good quantity of fruit so that we could taste the grapes and experiment with making juice and raisins, eating out of hand, freezing and making jelly. Before sharing our culinary adventures, it is important to reemphasize a few important steps to good production.

After you set out your vines it will take at least three years to see any production. Remember grapes grow very vigorously in the subtropics and will need to be pruned yearly for good grape production. After experimenting with various amounts of pruning, we found that pruning back 98% of the vine yearly allowed the plant to put more energy into flowering and grape production instead of vine and leaf growth. In the first few years you may need to go under the vine and clip off flower clusters that are misplaced, small, or have other defects. Sometimes I would remove 40-50% of the flower clusters. This seems to increase and improve production, quality, size and taste.

Because we had a small amount of grapes to process (282 clusters) we used processing equipment that we had in our kitchen for making juice, raisins, jelly, and frozen. This year we did not try making any wine or vinegar but could have. The information below is a short summary of our first attempts at processing various varieties and hopefully will be a beginning guideline for you to do your own experimenting.



*Harvesting Tamiami for juice
and raisins*

Lon Rombough also has a wonderful grape recipe book called “The Bountiful Grape: Using Everything the Grapevine Produces.” I highly recommend this book for beginning your culinary experiments.

Fruit Juice: We had enough fruit to make juice from Tamiami, Nesbitt, 8-52, Seminole,



Making juice with simple tools

Isabella and Everglades. Grapes need to be fully ripe, crushed, and then squeezed to extract the juice. Grapes were first washed and picked off the stem into a bowl. For crushing we tried the potato masher, but the best tool was the electric ice crusher. We also tried the Green Star Juicer which could not handle the amount of pulp. Then the crushed grapes were squeezed using two different techniques. The crush grapes were squeezed in a “grape press” but we also used a clean paint strainer bag squeezing and twisting it until all available juice was extracted. We toyed with the idea of crushing them

with clean feet in some kind of a vat, but decided we would hold off on that technique in the first year.

Juice seems to hold well in the fridge, and we discovered that pouring the freshly pressed juice into ice cube trays, freezing, and then putting into zip lock bags, would keep the juice for later in the year. However, frozen juice does not taste exactly the same as freshly pressed. There is nothing like freshly pressed grape juice!

Raisins: We made raisins in our home dehydrator from four different varieties, but discovered that the smaller grapes like the Tamiami and the B-52 made a better raisin than the larger varieties. We tried various temperatures from 90-125 degrees on the dehydrator and found that the 125 degree worked very well. Raisins were spread out in a single layer with multiple trays and would be dry in a single day if started in the morning. It’s best to continue tasting the raisin along the way to make sure it is not “overdone.” These are all seeded varieties and we discovered that the seed inside would also shrink and become lightly crispy making it easy to eat. Our Tamiami raisins are now safely kept in a sealed Ball Jar in our pantry for later use.



Variety Tamiami made an excellent raisin

Jelly: I like to make jams and jellies without using sugar. There are many ways to make these kinds of spreads. I experimented with making a refrigerator jelly. I took the squeezed leftovers from making juice, that included skins and pulp and gently pulsed them in the Vitamix, then simmered them gently in a pot with a lid for a few hours. I then strained out

the juice, returned to the stove and added some pectin that is specifically for use with low or no sugar, simmered that until thick, let it cool and then added a bit of honey tasting it before putting in a jar to be kept in the fridge. I could have added a squeeze of lemon juice that sometimes improves taste. It was delicious!

Frozen Grapes: With most varieties, all you need to do is wash the clusters, remove the berries from the stems, and then pack the fruit in air-tight freezer containers and seal them. Thawed, or partly thawed grapes can be used later on cereal, in cooking, or in a bowl by themselves. You can also try blending them in the Vitamix or blender with yogurt or bananas to make smoothies. I'm not sure how long they can remain frozen and still have good taste.

A word about Grape Seeds and New Grape Research: In our markets today, there are only a few varieties of grapes available for purchase, and they are all seedless varieties. They have a very mild taste and varieties that are not labeled "organic" are highly sprayed with chemicals. Most seedless varieties are vinifera grapes grown mostly in Europe or California and are for wine making. We have been experimenting with subtropical varieties that all have seeds. So let's look at the seed itself from a nutritional perspective.



Research shows grape seeds are full of important nutrients and have many health benefits. Grape seeds are edible and safe for eating everyday. Grape seeds are rich in vitamin E, linoleic acid, and powerful antioxidants. So let the little crunch be a nutritional addition to your daily food.

Grapes are a nutritious addition to any meal

Over the past 10 years, there have been many grape studies looking at the health benefits of eating grapes. Here are links to three studies but know that there are many many more.

From Critical Reviews in Food Science and Nutrition Volume 53 Issue 11: bit.ly/3IfbDzp

From Medical X Press 8/22 Issue: "Eating Grapes Could Hold Remarkable Potential for Health Benefits." bit.ly/3jLCMAJ

From the NIH National Library of Medicine – 12/21: "Grape bioactive molecules, and the potential health benefits in reducing the risk of heart diseases." bit.ly/3K6wgPw

Conclusion



Grapes do grow well and produce delicious fruit in Hawaii. Although this is not commonly known, and stock for growing table grape varieties is not readily available yet, reread Chapter 7 for ideas that will get you started. It is also possible that we will have some scion wood available once a year in February that you could purchase, root and grow out. However, we are a small farm with a limited number of vines but will try our best to help get this started. Because this is a wholly new fruit for Hawaii, a great deal of experimentation will need to be done by home producers and market farmers in the future to further the production of this nutritious fruit for the subtropics.

Read the Grape Resource page on our website, and invest in at least one good book such as “The Grape Grower: Guide to Organic Viticulture” by Lon Rombough. We will continue to update our website with new information, and will post new videos on our YouTube page. We will also continue to write Blogs when new information arises. The links to all resources can be found in the Appendix at the end of this book. There are blank pages at the end of this book you can use as a Log for your vineyard notes. We also look forward to hearing about your grape adventures.

We deeply appreciate each of you for your interest in following our Western SARE Research and Education Project for Hawaii – “Growing Table Grapes in Subtropical Hawaii Using Organic Practices.” Although this booklet wraps up the first seven years of research, we plan on continuing this project into the future and sharing information with all of you. Mahalo Nui!

Aloha,

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Acknowledgments



Since a very early age, Gerry has been interested in growing grapes and felt sure that because grapes are grown in all parts of the world they could also be grown successfully here in Hawaii. His research led him to meet the great Grapemen of America like Joseph Fennell an independent grape researcher from Florida, T.V. Munson grape researcher and breeder from Texas, Lon Rombough garden writer, nurseryman, and grape grower from Oregon, and Francisco Watlington-Linares Professor of tropical viticulture development in Puerto Rico and the Caribbean. Their research and work helped him to understand what characteristics to look for when choosing varieties for the subtropics.

We want to thank Western SARE: the Sustainable Agriculture Research and Education Initiative, and NIFA: the National Institute of Food and Agriculture both programs of the US Department of Agriculture for their support each step of the way. We are indeed fortunate in America to have government agencies dedicated to furthering and supporting the building of the components of our local and regional community food systems.

Mahalo to Ken Love our PI and the Hawaii Tropical Fruit Growers Association for their support and encouragement and their 2014 SARE Project, “Growing Grapes in Hawaii.” Mahalo to our statewide Stakeholders who followed our Blogs and Grape Resource Information over the past two years.

Mahalo to my wife Nancy for her support and encouragement, education and outreach ideas, writing and editing, and to Lyn Howe our amazing website and cover designer for this Booklet.

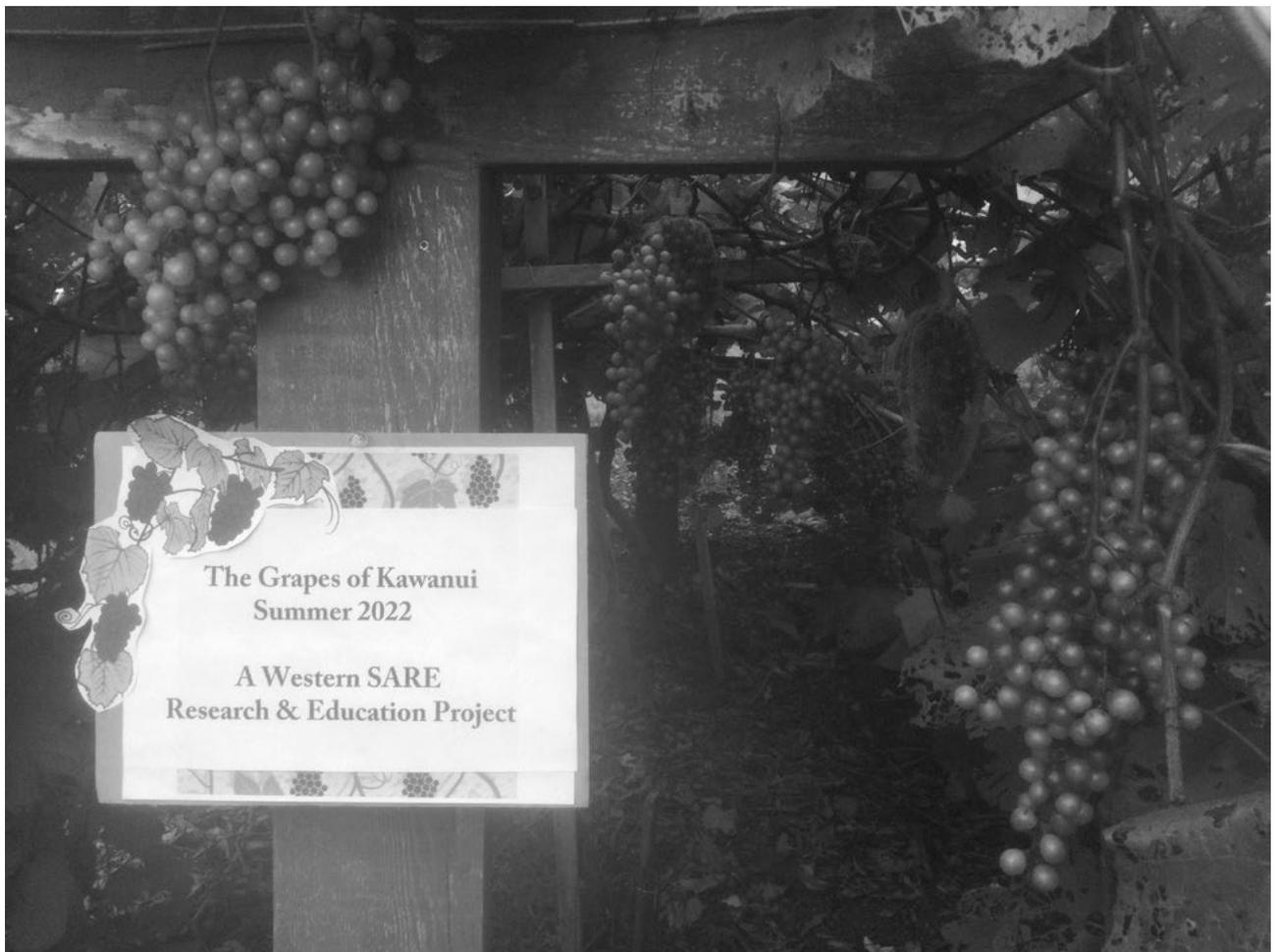


PI Ken Love and SARE's Stacie Clary visiting the farm in 2022

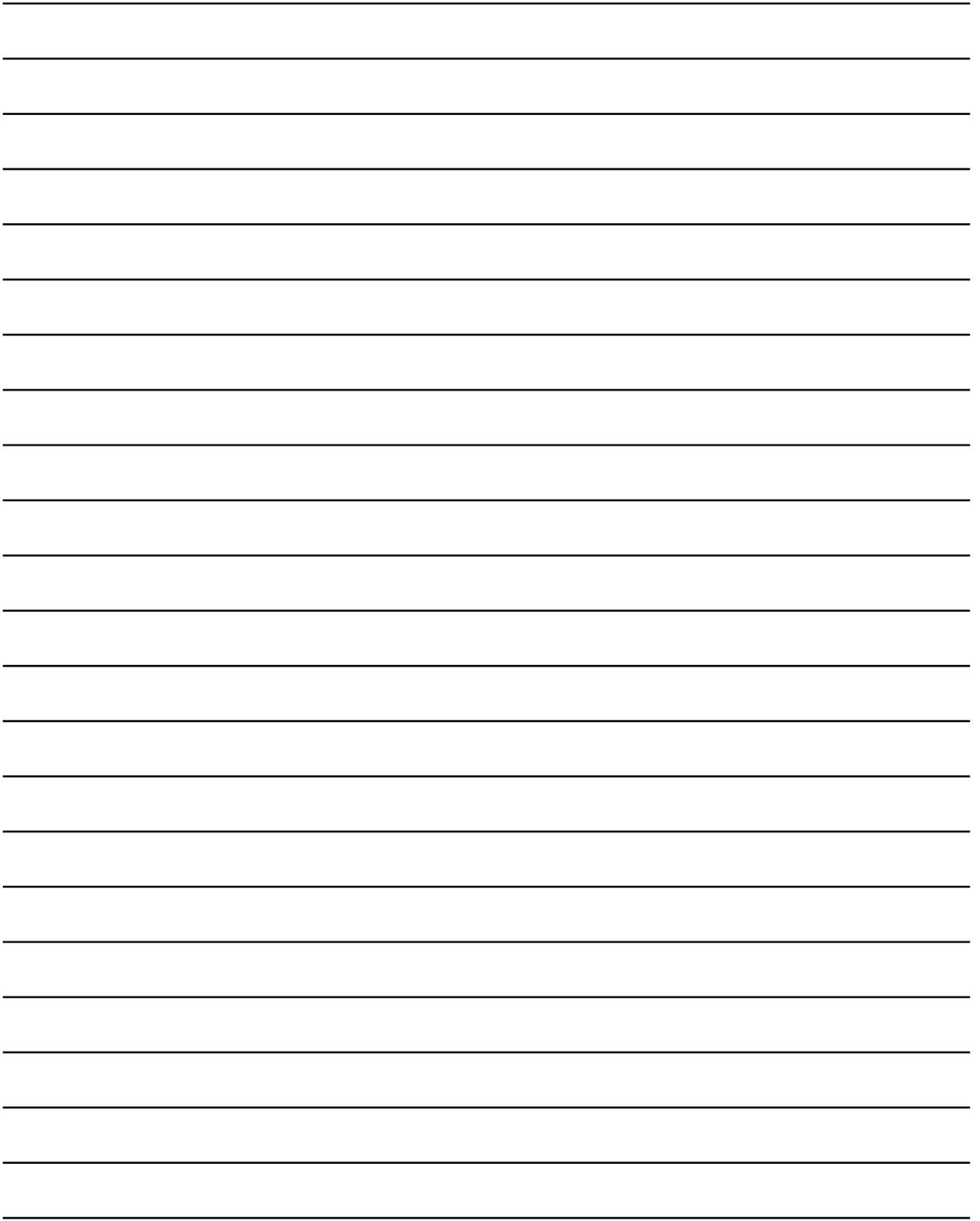
Appendix: Links to Grape Resources:

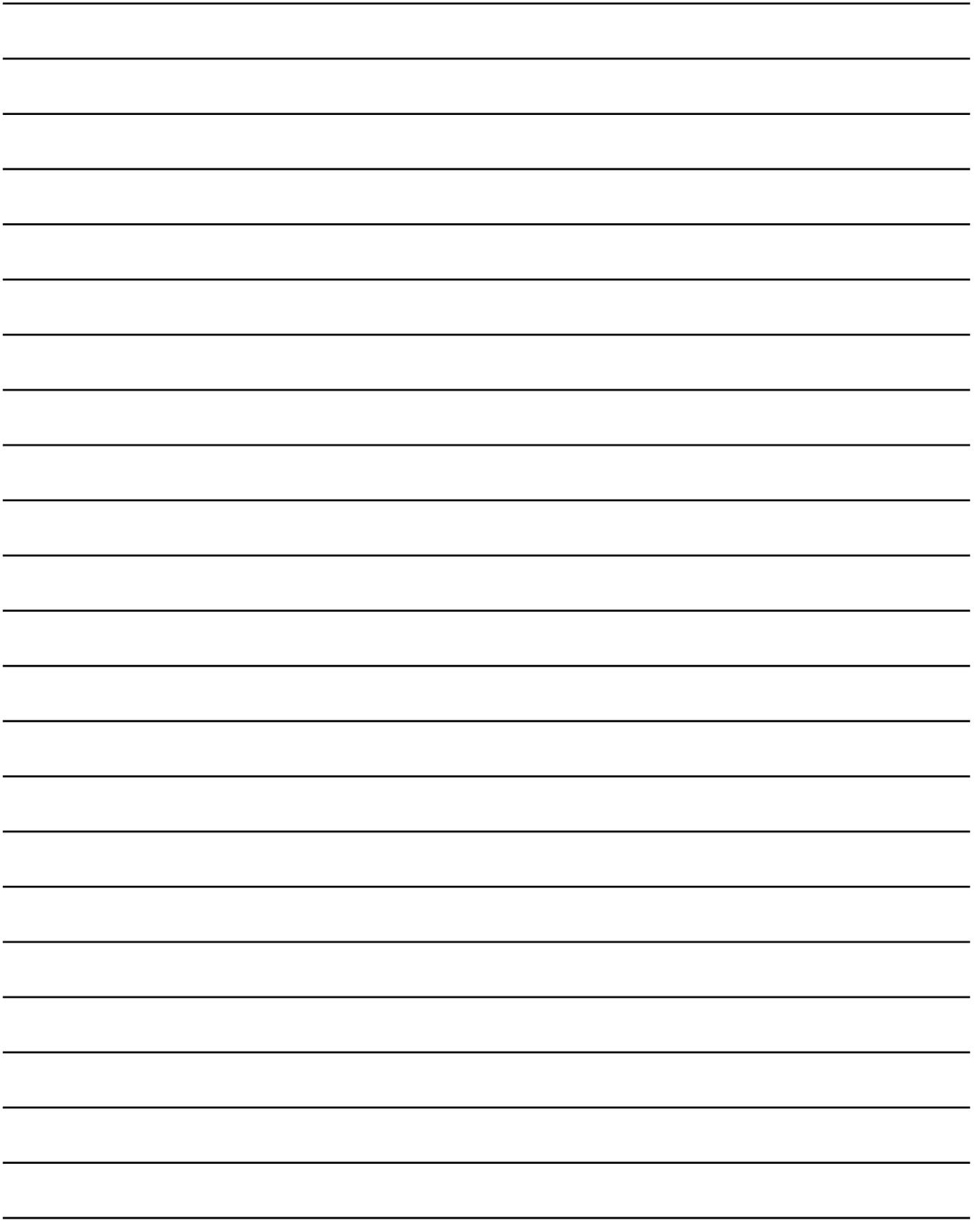


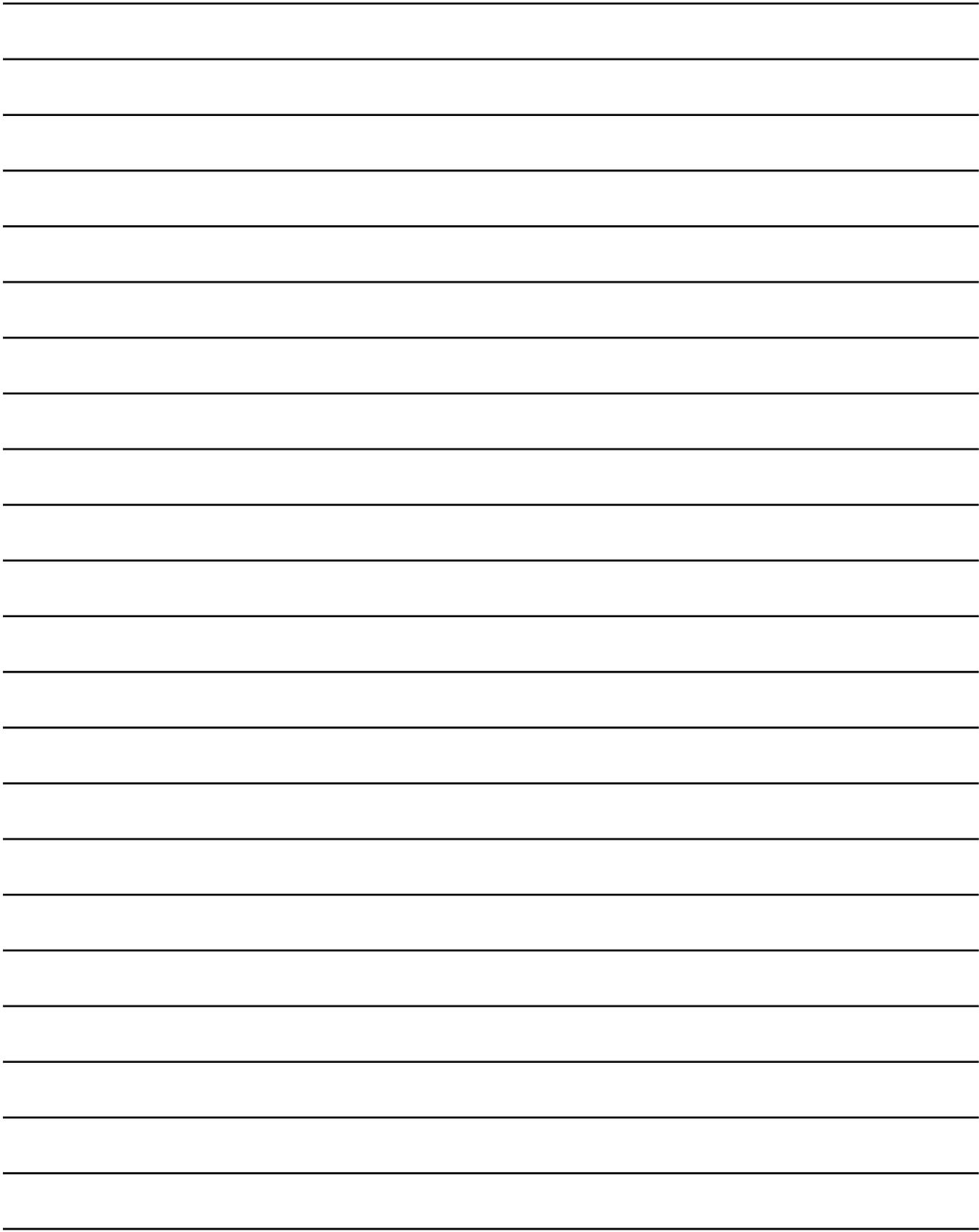
- Kawanui Farm Website: www.kawanuifarm.org
 - Growing Table Grapes Project: www.kawanuifarm.org/growing-table-grapes
 - Grape Blog: www.kawanuifarm.org/blog
 - Grape Photo Album: www.kawanuifarm.org/photos
 - Gerry's Research Notes and Design: www.kawanuifarm.org/re
 - Grape Resources Page: www.kawanuifarm.org/grape-resources
 - Grape Videos YouTube Page: <https://www.kawanuifarm.org/grapes>
 - Instagram: #grapesforhawaii
 - Western SARE: <https://western.sare.org>
 - Lon Rombough's Family website: www.bunchgrapes.com
 - Hawaii Tropical Fruit Growers: <https://www.htfg.org>
 - CTAHR Bulletin February 2014 "Growing Grapes in Hawai'i": <https://bit.ly/3Iz5Uoe>
 - Modified Geneva Double Curtain explained: www.kawanuifarm.org/re
- The Geneva Double Curtain system was developed at experimental station and grape repository in Geneva, New York. The system was developed to take advantage of maximum sunshine.



Summer abundance. Variety Tamiami







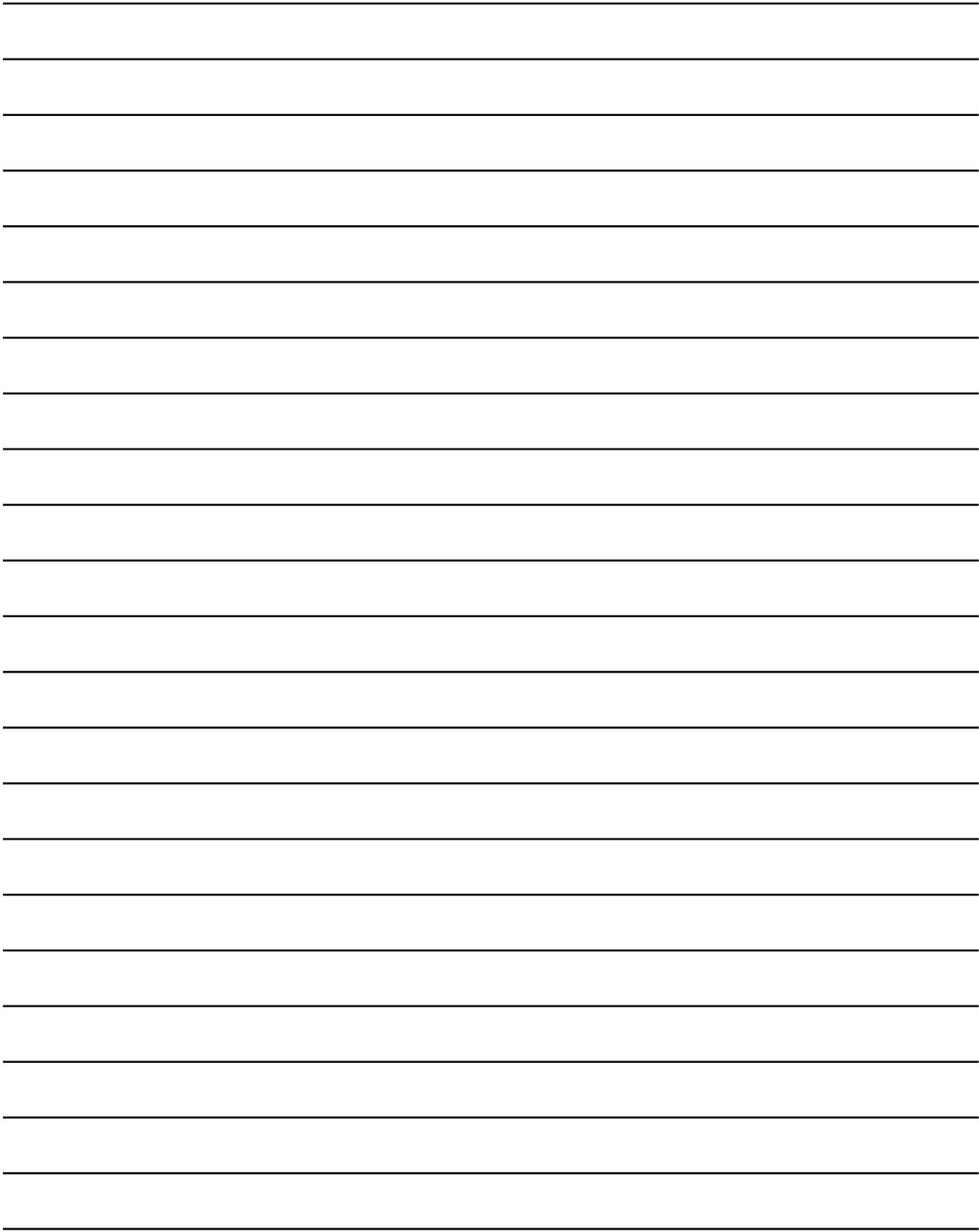






Photo by Shawn Linehan

Humans have been eating and cultivating grape varieties for thousands of years. Did you know that America is the country of origin of 6 of the 8 *Vitis* species of wild grapes? Wild grapes grow in all states except Alaska and Hawaii.... and were growing there before any people had arrived. Grapes are a nutritional superfood and scientists and doctors are currently giving a lot of attention to their health benefits. Although growing grapes is new for Hawaii's growers, tropical and subtropical varieties are grown worldwide. Come along with Gerry Herbert and Nancy Redfeather on their seven year research and education adventure to discover how to begin growing, cultivating and eating subtropical varieties of table grapes that can grow in your backyard, garden, or farm.

For the past 50 years, Gerry has grown many varieties of fruits, vegetables, and grains using organic practices, first on his 20 acre farm in Mendocino, and then on our one acre farm in Kona, Hawaii. He attended and graduated from the University of California Davis in Soil Science and Viticulture in the 1990s and was exposed to many different types of agricultural practices. His passion for grapes runs deep and he grew his first grape when he was thirteen and planted many varieties on his Mendocino farm before moving to Hawaii in 1994.

Nancy is an educator and avid home gardener and has grown organically since 1973.

This Project was sponsored by Western SARE, the Sustainable Agriculture Research and Education Program.