

Finding a New Crop

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"Pū'ali kalo i ka we 'ole"

Taro, for lack of water, grows misshapen.

Your effort will manifest itself in the end result.

"What crop should I grow?" is a common question farmers new and old commonly ask. With changing tastes and also changing weather, farmers have to stay ahead of the curve and not get complacent about what and how they farm. In a place where hundreds of different crops can be grown commercially, this can be a very difficult question, and also a very expensive one if you select the wrong crop. So what is the 'right' crop?

There are thought processes new and old farmers need to go through in selecting or finding a crop. At a recent interview for a new Extension Agent position on the Big Island, a question was posed to the candidate, "Someone approaches you and wants to grow tangerines at Pepe'ekeo on the Hamakua Coast. How would you help this person?"

The natural response to this question from a candidate would be to start in a discipline they're strongest in, one in which they have a solid background and can respond as an expert. An agronomist will start with soil, while a plant pathologist will look at diseases. Like the story of the three blind men touching a different part of an elephant

and trying to describe 'what is an elephant', so is the case with this important question. Whether it's a snake or a tree stump, having an understanding of the entire 'animal' to make a sound decision is an important step.

This is an exercise in some steps to consider in selecting a crop.



You can know what makes a crop tick by growing it.

You can start from the beginning in setting up a farm or start from the end in identifying a market and working backward. I prefer to start with the end in mind. Without a solid market, you're wasting your time. What is the market price and how large is the demand? Or you could create a market where none existed and this means spending a lot of time on the marketing side, and this could take up all your precious time.

Tangerine, or any citrus for that matter are long-term crops, and you may not turn a profit for seven years or more, so how do you pay your bills in the meantime? Long-term crops require more due diligence because you have to see way down the road, and may be unable to collect sufficient information to make a sound decision.

This may require actually growing the crop to have the information you need to move to the next step. There's a thought process and defined steps required to get to the right answer, and this means having a collection of accurate and trustworthy information to make a sound decision in whether to move forward with your project or not.

Due diligence is the most important aspect of your planning because this will guide your path for possibly generations to come. You cannot dream up all the positive aspects of your project without accurately evaluating the down sides. Talking yourself into doing something that may not work out is not a good way to proceed. An honest inventory of the pros and cons requires focus injected with a balance of both realism and idealism.

If you look at the U.S. citrus market, it's presently in disarray after Hurricane Irma destroyed parts of southern Florida, and had a major impact on citrus production, valued at \$9 billion. So far, our government hasn't been willing to bail out the citrus farmers so it's not clear if they'll get back to pre-hurricane production levels soon. Add the Citrus

Green Disease wreaking havoc on citrus there, and Florida citrus growers are really in a pickle. Citrus is a global market with oranges making up about half of all production, but production in the Americas is huge producing about 70% of global production, with Brazil as a major player especially for processed citrus, with Florida right behind it.

Agreements and policies between the U.S. and other nations dictate a lot of what can come into their market and how much citrus will be allowed into the U.S. market, and this is in flux with the renegotiation of NAFTA, the North American Free Trade Agreement, and also World Trade Organization agreements.



Transportation is a major cost for neighbor island farmers when competing in the Honolulu market.

There are other sleeping giants waiting in the wings, such as Mexico who could produce a lot of citrus if more were allowed into the U.S. market. Argentina lemons are also edging their way into the US market. We have little influence over policy, so as a farmer, you control the things you have control over, and you have a lot of control over a lot of

things, especially on the production side.

Tangerines are sold on the fresh fruit market, with the bulk imported from California. Any weather anomaly can create either over- or under-supply, and your tangerines will be part of this market, along with every backyard grower in Hilo if you're selling on the Big Island. How will you deal with these large and small bumps in the road?

There's a belief that the farther away you sell your crop from your home base, the more valuable it will be. This is sometimes the case, but tangerines are both fragile and delicate, and must be refrigerated to maintain its shelf life. Knowing your competition is part of the game. Try selling dragon fruit in Chinatown on Oahu when Vietnam is flooding the market, retailing for \$1.99 and you're trying to sell yours for \$3 wholesale? This is real!

So the market is the first step, and there are a lot of crops that could be grown commercially on the Big Island, and I suspect that a lot of it is presently ending up on the ground, not only avocados. There's an agribusiness waiting to be created from present waste and culls, but this is for another newsletter.

The 'market' is a nebulous word and conjures all kinds of ideas and also misconceptions. Yes, the citrus market is in flux and how do you get in there and stake your claim? As a farmer friend used to say to me, "There's a lot of

moving parts", which reminds me of a Swiss watch that no longer works. Any break in one cog screws up the entire works, and it's usually the little things that can cause the greatest problems.

Contrary to popular belief, most wholesalers in Hawaii don't care where the crop comes from, as their starting price is 'California plus freight', not special dividends or bonuses for fresh or Hawaii grown. This is a stark reality unless you can find a few marketers and markets who espouse to these values and they're out there, but you have to find them.



Does your crop require electricity for post-harvest processing? Maui's Kaheawa Ridge windmills

Too many farmers spend most of their time in the production phase without committing enough energy on marketing, and as a result, they don't get top dollar for their product. At the same time, you can't spend a lot of time on marketing if you have nothing to sell, so the sweet spot is somewhere in the middle. Knowing what's going on in the market, in every segment of the market, is very important.

Citrus is the highest value crop in terms of international trade. What kind of citrus is California and Florida growing and why? Who has the competitive advantage in growing different kinds of citrus? What seasons do they focus on? The California citrus industry is based on oranges, the Valencia variety for summer sales and the Navel for winter sales with some overlap during the spring months, but there's some expansion into tangerines, and you see a lot of it on the Hawaii market. Florida has is more focused on juice, but more in flux and could change overnight as Brazil expands.

This has to do with seasons when their products are available and whether they have competitive advantages over other major production areas. Once you have mature trees in the ground, chopping it all down and grafting another citrus variety is an option, albeit costly, but this has happened both in California and Florida

Sometimes imported tangerines are sweet and sometimes they're not, so we in Hawaii don't always get the best tasting fruits because they're all picked for shipment and not at the peak of ripeness. This may be an opportunity for local growers, but this takes marketing and education, and also product promotion.

California tangerines are seedless so this is the market standard, but not all tangerine varieties are seedless. Keeping seedless tangerines seedless can be a challenge, and it means not

having bees pollinating your tangerines with pollen from another citrus species or sometimes even another variety of tangerine for that matter.

It's been said that most citrus are hybrids between different citrus species. Then you have tangors, a cross between tangerines and oranges sold as tangerines such as Honey or Murcott, and you also have tantangelos which is a cross between a tangerine and a tangelo, while a tangelo is a cross between a tangerine and a pumelo, so you get the picture.



Turmeric has been touted as the next hot export crop for Hawaii, but can we distinguish our crop in the marketplace from others imported from China or Southeast Asia?

Last year, some citrus growers in California were suing bee keepers for cross pollinating their tangerines and creating seeds, so how are you going to protect your tangerines from producing

seeds, a natural process for most plants, or you can come up with some cockamamy marketing approach that tangerines with seeds are healthier for you and contain special antioxidants if you eat the seeds?!?!

This is also part of marketing. It all comes down to how much time you want to spend time on a different aspects of farm planning, but time is money, something most new farmers have little of. There's some merit to going through a strategic planning process to get to yes or no, starting with you.

After being involved in extension work for over 35 years, I think I've seen farmers of all shapes and sizes, and there's a certain kind of mindset required in going through the steps like not willing to accept no for an answer or having real drive. There's money to be made out there because more humans are born each day, and less are dying, so you have a growing market. This is basic economics. More people have to eat, and eat tangerines they will.

Varieties and Challenges

I use the term 'tangerine' loosely because that's what we call them in Hawaii, while those from other places call it mandarin, which may not be accurate either. While it's good to know where the 'tangerine' varieties originated just from the standpoint of adaptability to your farm climate, this information may not help you due to cultivars selected in other climatic regions of the world.

Tangerine could be considered the citrus of the future since its more cold tolerant than oranges and among the most drought tolerant, requiring less water to produce a crop compared to other citrus. Tangerines are believed to have originated in Southeast Asia and the Philippines. With sufficient isolation and selection, tangerines have evolved as unique varieties or cultivars.



The importance of selecting the right variety cannot be underestimated. Some dragon fruit varieties may yield 3-4 times more than average varieties. The right fruit color can also enhance product demand on the market and distinguish you from the others. USDA dragon fruit accessions.

Depending on what botanist you ascribe to, tangerines are separated into classes or subgroups, including Tangerine, Mandarin, and Satsuma. Others would add a few more classes or subgroups. The Ponkan is esteemed in China and also known as Chinese

Honey Orange, and are the most tropical in adaptability, but they don't like hot arid conditions. The Mediterranean or Italian, also known as Willowleaf is considered a Mandarin. It has a drooping habit, known for its distinctive aroma, and is believed to have been brought to Italy from Egypt and Malta. The Satsumas or Unshu originate from Japan, and prefer cooler conditions. The King or King of Siam group is from Vietnam, and has the largest fruits.

The Tangerine group is the most important for breeding in Hawaii, and originated from North Africa, around Tangiers, Morocco where the name 'tangerine' comes from. An important tangerine is Clementine or Algerian, a small fruit with many good qualities and a parent of many excellent tangerines adapted to Hawaii conditions. Hawaii has some really sweet and juicy tangerines, but which variety should you grow and are they all really tangerines?

Recommended varieties for Hawaii based on observations at Hawaii Research Stations include Fairchild, Freemont, Lee and Nova. However, this is not based on recent observations throughout the state. Fairchild, Lee, and Nova are selections of a cross between Clementine and Orlando tangelo, so all are technically tantangelos, while Freemont is a selection from a cross between Clementine and Ponkan.

Others varieties that have done well in some parts of the state include Dancy, Satsuma, Ponkan, Wilkings, Clementine, and many more not to

mention that tasty seedling in your neighbor's yard. This is one place to start, but if you pick the wrong variety it could be a disaster.

Each variety has its pros and cons such as sunburn tolerance, easy peeling, high brix, disease resistance, and concentrated fruit set versus a little production throughout the year. There are also tradeoffs; easy peeling varieties don't store well on the tree. Having a tangerine that's consistently sweet is the goal, but a lot of it depends on your farm weather along with how you care for your crops, and knowing how to take care of your crop is a definite advantage. All of this seems complicated, but so is agriculture.



Growing the right variety can make the difference, between success and failure. Lacinato or Dinosaur kale is one of the most popular.

What about the root stock, a very important part of a healthy plant that can affect plant size and vigor as well as resistance to root diseases like Phytophthora and other diseases? A recent publication on the topic, Tropical Fruit Tree Propagation Guide by Ken Love, Robert E. Paull, Alyssa Cho, and

Andrea Kawabata helps to sort out the rootstock dilemma but this is a moving target due to new information, new diseases, and so many soil and climate interactions in Hawaii. Kona isn't Ho'olehua, and Hilo isn't Ewa.

What diseases are out there? Each citrus production area of the world faces serious diseases. Recently, citrus greening disease from China is wreaking havoc on trees in Florida and California. Although not presently in Hawaii, that could change quickly especially since we have a propensity of attracting new diseases, and of all the states, we hold the record for the most invasive species introduced.

There's an emerging disease in Brazil called Citrus Sudden Death and they're still trying to sort it out, but it's already forcing some large growers to shift to other crops such as sugar cane. If you don't know what disease you're dealing with, how can you control it?

The worst disease in Hawaii is Tristeza virus or Quick Decline, and I've seen it decimate a 5-acre Mexican Lime orchard on East Molokai in about 8 years. A good publication on the subject is Citrus Tristeza Virus in Hawai'i by Scot Nelson, Michael Melzer, and John Hu. In a recent survey of the disease, almost 75% of citrus plants testing showed the presence of Tristeza. For access to publications listed here, just google UH CTAHR Publications and punch in the publication name.

What is the ideal weather for tangerines? I've tasted really good tangerines from Hilo, Manoa, and also Kalae and Ho'olehua on Molokai. Ideally, it's a hot day with a cold night and access to sufficient water. Most citrus are fairly heat- and drought-tolerant but they have critical times when inadequate water can adversely affect fruit quality, especially from flowering to harvest. Too much or too little water can spoil an otherwise sweet and juicy tangerine.

So the citrus world is truly in flux, but out of confusion hopefully comes stasis or equilibrium where a farmer can have access to most of the important information to assess the feasibility of a crop. A present or future farmer needs to be well versed in every aspect of a potential crop, and this is only a small snap shot of some of the important aspects in selecting a crop. You still have to know how to grow the crop.



Maybe an organic fruit crop such as papaya could really distinguish your product in the marketplace?

Here's a reprint of an article I wrote a few years ago. I probably received more feedback on this article than anything I have previously written. It was based on discussions with a new farmer who had a very difficult time getting his project off the ground. It relates to what we're talking about in selecting a crop and much more. You can have the land and the market, but without knowledge, motivation and a path laid out, you cannot get to square one, and this is what this article addresses. It's also about commitment. So here it is:

Letter to Sonny

Below is a letter I wrote to a Hawaiian homestead farmer. I was trying to get him to understand about farming because he wasn't grounded, and was looking for solutions that were unreasonable such as using his farm to teach others how to farm without having basic farming knowledge or networking with other farmers when he didn't have any production. I really had to write everything down so he could understand without dampening his enthusiasm and spirit. I think it may help anyone who's interested in farming. There are many things to grasp in farming.

Dear Sonny,

I write this to you to help you focus and see the steps you need to take in farming in order to create a farm business. In life, you need to crawl before you can walk. There's so much to know, and you cannot 'skip grades'; you

have to start at kindergarten or pre-school for that matter. You have to be diligent in learning all you can by studying, and you have to go at it with both eyes open. Most farmers in Hawaii farm part-time because they cannot make enough money off their farm, and also want to have medical coverage for their family. Part-time farming is also a growing trend in the nation.

Motivation

There are certain attributes that must be in place in order to be successful in farming. One is the willingness and motivation to farm and to overcome adversity. We cannot supply this because it comes from deep within you. If you're easily discouraged, farming is not for you. This stick-to-it-ness is important especially when things don't go the way you expect. When the going gets rough, the tough get going. In farming, the real test when you fall is how fast you get up.



Growing a new unfamiliar crop is always a challenge for farmers, old and new. A new variety of kale, Roulette.

Break It Down

Farming is hard work and there's a sequence to things. One thing I've learned is I try to look at a few things at a time because if I try to grasp the whole picture, it becomes overwhelming. Although it's important to know the big picture, if you break down tasks and responsibilities into bite-sized pieces, it's easier to comprehend and also to execute. When you complete the first task, you can go on to the next one, and before you know it, you just completed a major task. For me, if I have a sequence of things I need to get done, I have to write it down.

Knowledge

After motivation, I stress knowledge because this is my background. Tutu Mary Pukui stressed that there are many schools in which to learn in. What this means is knowledge is all around you, from kupuna or elders to even your kids, friends, books, internet, mentors, neighboring farmers, even your land, and more. My homestead teaches me a lot. Farming is like a bank account; you gotta put in before you can take out. There is so much to know and you need to constantly seek out this knowledge, because it will not just come to you. Knowledge comes in many forms and you can never have too much of it. I'm constantly seeking new knowledge, and it can be found in many places.

Choosing a crop is a big decision, and you can only choose a crop if you have knowledge about farming and about this

crop, and have assessed this crop in detail. This is an important early step. If I'm interested in a crop, I try to learn everything I can about it, and even grow it in my garden to learn more. The more you know about the crop and how to grow it, the better able you are to succeed in producing the crop.



Maybe a new tomato variety such as two-tone slicer can break you into the market.

We never try to tell people what crop to grow. We can suggest a few crops, but the real choice lies with you, and you must spend the time, the due diligence, to research and investigate the crop you're interested in, compiling as much information as possible to make an informed decision. You have to answer a lot of questions, and the more questions you answer the better informed your ultimate decision will be, and there's a better chance of succeeding at farming.

More than Money

A big mistake many make is they think that money is their big limiting factor, and they go after loans and grants only

to end up in the hole because they don't have a plan and they don't have enough knowledge of farming. There's a high rate of failure in agriculture so you have to go at it with both eyes open. To succeed in farming, you have to be willing to do the same thing over and over again until you can do it in your sleep. Don't get me wrong, the money part is important and in farming, you're always making economic decisions, but you have to seek the knowledge first.



Pollination is absolutely required for crops such as melons and squashes, while many crop yields and quality are enhanced by pollination.

Learning by doing is the best way, with books and classes helping you to better understand what you're doing. And you have to enjoy what you do. I encourage many people to grow a garden or a small nursery area. From this, you can find some crops that you may want to grow.

Farming is a Business

Agriculture is highly competitive, and is a business. It needs to be run as one. You're constantly looking at ways to improve efficiency, cut costs, and

increase profits. The business part can only come when you know each step in growing the crop. Otherwise, it's going to be impossible to develop a business plan. You have to fill in every blank and you have to know what number goes in there.

When someone is interested in growing a crop, I tell them to grow a row of the crop and collect all the information you can in order to come up with a plan such as how many pounds can a plant produce, pest problems, days to harvest, and what are the grade out percentages.

The Crop and the Market

What are the limiting factors to this crop? Does it only fruit once a year? What if the weather is bad when the flowers come out? Will it wipe out your crop until next year? What is the market price? If the weather is good, it's good for all the other growers of this crop in your area. If this is the case, there may be too much of this crop on the market at the same time, and the price will drop.

Also, do you enjoy growing that crop and will it make you money? This is the million dollar question. How much money will you make? If I sell my carrots for 50 cents a pound, how many pounds do I have to harvest in order to gross \$50,000 (Answer: 100,000 pounds of Grade A carrots). Out of the gross, how much is the net? Maybe just 20% or \$10,000.

What does the market want and how much do they want? Sometimes it's easier to push the pencil than the hoe only to find you actually lost money on the crop. The big question you have to ask yourself is 'where is my market?' Your market could be right in your neighborhood. What do they want? Ask them. What can you sell to them every week? Maybe its nursery plants, or vegetable starters, or luau leaf, or fresh vegetables, or fresh lettuce. Once people eat fresh vegetables, many become hooked.



When the weather is a bit chilly, we levitate to soup, Portuguese Bean Soup

I like to find out what the market wants and also how many pounds they can use each week and work backwards from there. In this way, I'll know how much I need to plant in order to reach my market goal. This isn't always that simple because consumption fluctuates especially in small communities and can be very weather-dependent. When it's cold and wet, families may eat more soup and will buy ingredients for soup, while in summer may buy more products for picnics, for example.

Competitive advantage means "what advantages do you have over other farmers on other islands or even in your community that will allow you to succeed and be competitive in the marketplace?" You may have special knowledge, or special weather, or a unique production system, or free water, or a large family, or a special variety of a crop. Some advantages are apparent now, and some will become apparent in the future.

When I farmed on Oahu, we were able to deliver on demand whenever the stores wanted our crop, and we planted a large enough amount so we controlled market prices. You cannot do this on Molokai if you're selling your crop on Oahu. Again, you may have to discover all your advantages because they may not be apparent right now. You have a market, and it may be right in front of your eyes.

How Solid is Your Plan?

In my job, I try to play the devil's advocate and question everything about the crop when farmers come to see me. In other words, I try to discourage them in order to see how strong their plan or strategy or motivation really is. If you have a good plan, it should be able to weather all inquiries and questioning. By doing this, you make your plan stronger if you can handle criticism.

All kinds of things can go wrong, and a good farmer will be aware of what these are and have a solution in their back pocket. Anticipating these challenges is

what separates one who's trying to figure out what's going on to one who knows and does something about it. This is the knowledge and experience part, and you can never have enough of this. I believe if you put enough positive energy into something, something positive will come out of it.

Important Concepts

In farming, we have a law called the Law of the Minimum and this applies to all kinds of things. In plant nutrition, all you have to be is short in one nutrient and it will affect how healthy and productive your crop will be. What you lack in knowledge will be your limiting factors. You constantly want to strengthen your weaknesses and not run away from them, whether it's weeding or bookkeeping or marketing.

There's another concept in agriculture called the art and the science of agriculture. The science is the knowledge part, and the art is what you do with this knowledge. The art part involves innovation and new ideas, but starts with the knowledge. Once you have the knowledge, you can start to tweak it with new ideas.

Because labor is the biggest cost, innovation that cuts down on labor costs is a critical area. It may be an easier way to plant or harvest, or injecting efficiencies in your entire operation. Finding a market for your off-grade such as a new value-added product or even innovative packaging can increase income as well. This is where your

ingenuity comes in; your creative juices go to work to create a product so unique that everyone wonders why they didn't come up with that one.



How much is the competition selling their crop and is there room for you?

One Step at a Time

There are a lot of things that need to be done on your land right now that doesn't take a lot of money but a lot of sweat. There's a method to the madness and part of it is getting to know your land and building a bond with it. After a while, it becomes a part of you. You have to get out there and do it, but you also have to constantly assess what you're doing all the time, and ideas will come to you.

Visit other farms and see what they're doing. Don't try to spend a lot of money right now. I farmed for over 20 years without a tractor because I designed it so I didn't have to spend a lot of money on equipment. But just because you have land doesn't mean you can and will succeed in farming. This is just one piece of the puzzle, and there are many more pieces. What are some of the

other pieces of the puzzle that need to be in place?

Also, you need to realize that we don't have all the answers, and you may have to find them out yourself. The key is to be realistic in your expectations, and continue to grow in knowledge so you can make informed decisions. We all have different skills and gifts, and in farming, we try to capitalize on our special skills. And remember, one step at a time. In order to harvest, you have to plant first.

My Advice

My advice to you is to grow a garden and expand your garden a little at a time. Expand by planting in phases, in rows or in blocks. When you have surplus food from your garden, construct a garden stand along the road in front of your homestead. You can start selling once a week, maybe Saturday morning, then expand to twice a week, maybe Wednesday afternoon, 5-6 pm as you harvest more and cannot hold until Saturday.

By talking to your customers, they will tell you what they want to buy, and you can expand on these crops. You may not be able to grow one crop all year-long due to insect or disease build-up, but you might be able to move the crop around to other areas of your homestead. Soon you will have an established clientele coming to you each week, and all you have to do is grow the crops they want. A garden stand is allowed on Hawaiian Hawaiian Home

Lands if you're selling your own produce. Start small and grow your market, and make sure you have people willing to buy what you grow.

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Well, that's it for this quarter and this year! Boy how time flies before its winter. Our night temperatures just hit 50 degrees F. Great for lettuce, broccoli and tomato, and also great for sleeping and building up energy for another day. Happy Holidays to all and enjoy your time with ohana and others close to you.

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A December 2017 harvest of Christmas ornaments

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