

Signs of Spring

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I think spring is upon us, but it's difficult to tell at times. One day it's cold and rainy, and the next day it's sunny and hot, but at least it's changing. There's still some crazy weather on the mainland, and gusty winds along with torrential, flooding rains on Molokai, which really adds to the confusion of the seasons. These mixed signals are



Extreme spring flush of Avocado flowers

hard to read, so many farmers will hold off on major spring plantings until there's solid indication that spring is here, but I know of some who already planted watermelons in January!?!? When everyone goes left, you go right.

The overproduction of avocado flowers tells me there's still some wet and wild weather ahead. We all have signs we live by, and hopefully they provide us with right insight at the right time, because in farming as in life, it's all about timing. In this issue, I feature some of the Solanaceae family, the sun-loving vegetables, highlight some vegetable varieties, and discuss about breaking hybrids, and more...

Talking Tomatoes

What did the large tomato say to the small tomato? Ketchup!

If tomatoes could talk, they could tell us about what's so unique about them; their aroma, their complex flavors, and their after-tastes, just to mention a few. Some experts studying taste and smell comment that we predetermine how something will taste by what we smell first, and if it doesn't smell good, then it must not taste good. But for a tomato, to know it is to taste it. There's a tomato renaissance happening with all shapes, sizes, and colors coming to the forefront. With so many old, new, and rediscovered tomatoes featured each spring, it's difficult to test them all.

Whittling down choices starts by asking a few basic questions. What size tomato fits your market or your taste? Some like it large, while others like it bite-sized. The second is what plant type fits your situation? Determinate or bush types are great for field growing, while trellis or indeterminate types are usually grown in green and shade houses, and in protected back yards. The third decision is what diseases are prevalent

in your neck of the woods? From there, you can eliminate a bunch of varieties and hone in on ones that fit you best.

Grape tomatoes are my favorite! They sell for a higher price, but are more labor intensive. Larger tomatoes are easier to harvest, but insects seem to prefer them, so there are tradeoffs, but it's difficult to make a tomato sandwich with grape tomatoes. For the mobile lifestyle, a grape tomato is convenient, and just takes rinsing and plopping a few in a salad to make a quick, healthy meal. Plus, expect a taste explosion when chomping into a great grape tomato.



Plant type is dictated by your unique weather conditions, and also the environment you're growing it in, such as fields or in structures. Bush types do well in windy areas or areas with constantly changing wind directions, while indeterminate types will bear over a longer season, but require a protected area due to their tall growth habit and are better suited for greenhouses. There are so many grape tomatoes to choose from, so I select for disease resistance, taste, and then color.

The cast iron of grape tomatoes is UH's own **Komohana**. Not the sweetest in the winter, but usually the last one standing when the rains don't stop. Its thick skin protects against cracking, which is a problem in erratic weather with softer, thinned skinned varieties. Komohana is a favorite for dehydrating, and also great for salsa. Another slightly larger grape is **Juliet**, at around 30 grams, a beautiful mini roma. Most grape types are trellis or indeterminate types, but there's a few determinates that are very sweet, including the yellow **Aria** and the more delicate red, **Sugary**.

It's a good strategy to grow red and orange types of the same shape and weight to create an eye-catching, multi-colored basket of bite-sized beauties. Some grape seed are very expensive, but you only need a few seed to produce hundreds of fruits. Recently, I was quoted \$10,000 for 1 kilogram or 2.2 lbs. of grape tomato seed, wholesale! Let's not forget cherry tomatoes! A very popular orange cherry on the mainland is **Sun Gold**, a trellis type with an intense fruity flavor. Also, many cherries are strong plants and have a broad range of disease resistances since they're closer to the wild species, but choosing for taste and fruit size are also important priorities.

The big boys, including Beefsteaks, are always a challenge to grow. For the determinate types, **Celebrity** is one of the most reliable. An All-America selection, Celebrity's bloodline can be traced to a famous Hawaii tomato, **Anahu**, known for its

multiple-disease resistance and great flavor. We don't grow enough indeterminate beefsteaks on Molokai to know the best, but greenhouse tomatoes and field grown tomatoes are completely different animals from where I come from. Real soil makes a real tomato with a distinctive earthy taste bathed by the sun.

The presence of Tomato Yellow Leaf Curl Virus (TYLCV) on Oahu and Maui may dictate choosing a variety with resistance to this disease. Originally, many TYLCV resistant varieties were coming out of the Middle East, but today there are many to choose from developed in the U.S. Tomato Spotted Wilt Virus (TSWV) is another problem on some islands, but luckily for us on Molokai, we haven't seen both of these diseases yet. There are a few TSWV-resistant varieties on the market, but selecting for taste and yield are also important.



Tomato Yellow Leaf Curl Virus

Combining heirlooms with new fruit types, such as grapes and cherries is a new breeding direction. The influx of new varieties from Eastern Europe, such as 'black' and 'tiger' types are adding to this excitement. The latest stripe types include the breeding of Fred Hempel of Baia Nicchia Farm in California, and Brad Gates of Wild Boar Farms, also in California. Fred Hempel's Artisan Series include the Bumblebee Series with fruits of different colors and contrasting stripes, the Tiger Series are pointed grapes with stripes, and the Blush series are new color combinations.

Wild Boar Farms has concentrated on large fruits with contrasting stripes and fruit colors. Color is the latest thing with whitish, blackish, and even purple fruits, including the Indigo Series developed by Oregon State University vegetable breeder Jim Myers. At the end of the day, it all comes down to taste, and also what kind of taste you're looking for. There has never been this range of tastes in the history of the lowly tomato.

Hawaii is a disease magnet, but one way of avoiding it is to grow tomatoes only in a well-defined summer slot. Field growing in the off-season requires varieties that can withstand foliar and root diseases prevalent during this period. Knowing what diseases are



*TYLCV-Resistant Tomato Trials
Poamoho Experimental Station, Oahu*

prevalent in your area and seeking out varieties with resistance to diseases. Many seed catalogs won't tell you what varieties are resistant to, so you need to do some super sleuthing. One way is to check out the list of tomato varieties at the North Carolina State University listed alphabetically:

<http://cuke.hort.ncsu.edu/cucurbit/wehner/vegcult/tomatoai.html>.

Another way is by growing two or three varieties side-by-side, then determining which one has the best combination of attributes you want, such as disease-resistance, taste, yield, and good looks, although there's much more to evaluate but just keep it simple. A full-bodied taste with a combination of sweet and tangy is something I look for.

A Kaleidoscope of Tomato Colors

With increased global sharing of seeds, we're seeing all kinds of tomatoes, each with its own distinctive combination of colors and flavors. Part of the splash of new colors is the revival of heirloom varieties, those over 50 years old or those retained by a family solely for its own garden produce. More recently, increased accessibility to seed from the former communist bloc nations of central and eastern Europe has broadened the color and taste palate. These color and taste descriptions below are adapted from a discussion on tomato color in the Hummert Seed Company catalog a few years ago.

Flavors are described based on our own personal experiences, and tomato has a distinctive combination of flavors defined as acid, sweet, and savory. Of these, savory is defined as pleasing to the sense of taste and is called undertones, sometimes described as salty, smoky, spicy, or even a richness. It's a combination or balance of these three flavors that make a great tomato. Tomato colors are related to the types and levels of antioxidants, nutrients, and sugars. Red tomatoes produce more lycopene, while greens produce more chlorophyll. Today, we have about eight different color classes:

- RED is the most common color, which has a crimson interior and yellow skin that creates its bright red appearance. Its flavor is balanced, with a little more acid than sweet and a mild savory undertone.
- YELLOW, which runs from light yellow to orange, is sweeter but less acidic than red. The flesh has a meatier texture.
- PINK is similar to red in the interior but has clear skin, imparting a pinkish skin color. It has a thinner skin, so it's more delicate than most reds. It's sweeter but with some acid, and the savory undertone is strong, creating a richer taste than reds.

- GREEN, also called GWR or “Green when Ripe” doesn’t turn red when ripe since it retains chlorophyll, creating a green color. It’s sweet, zesty, rich and spicy. Uncommon in Hawaii, they’re not to be confused with unripe green tomatoes.
- WHITE is another uncommon color, which leans to the sweeter side, but the acid comes across as citric. Sometimes our eyes affect what we taste.
- PURPLE tomatoes also retain their chlorophyll through the ripening process, so the green skin covering a pink flesh comes out as a purple. The flavor is like a pink, but with a savory described by some as smoky.
- BLACK tomatoes also retain their chlorophyll, but the green skin is covering a red tomato, so the color comes out at mahogany, chestnut, or bronze, referred to as black. All true blacks originate from Russia. The flavor is rich and complex, and usually very acidic with strong savory undertones, referred to by some as salty.
- GERMAN YELLOWS are bi-colored or multi-colored, usually a yellow base with red stripes. These striped beauties are very sweet with a sparkling undertone, and has been the basis of a new breeding direction mentioned earlier.

So what makes a great tasting tomato? It starts in the eye of the beholder, and ends in the mouth of the taster, but it’s usually the right combination of acid, sugar, and savory to suit your personal taste. One without the others doesn’t make for a rich, flavorful tomato with a complex, full-bodied taste. Sometimes our favorite tastes are what we’ve grown accustomed to, such as ‘sweet-sour’ in Hawaii.

Old New Varieties

In Hawaii, many vegetable varieties grow OK, but some grow and taste better than



Cauliflower, Cheddar - Molokai Grown

others, and the only way is to know them is to grow them in the different seasons alongside an old favorite. Breeders, both professional and amateur, are continually developing new varieties by improving on old ones, and also finding new varieties from other parts of the world, sometimes falling upon some interesting stuff, and also creating new ones. After scurrying through a one-foot stack of seed catalogs shared by friends and some I’ve collected, I’ve come up with some new-old ones that are worth trying:

Cauliflower: Living in the shadows of its popular regal crown cousin, the broccoli, cauliflower is coming onto its own with new crown colors that are taking the high-end markets by storm. Dark purple heading **Graffiti** is stunning and has a nutty taste, while **Cheddar** forms a light orange crown and is a real treat. Mix the two together fresh for a pupu platter with a creamy dip and you have something very unique. Cheddar matures almost a month before Graffiti, but that stunning dark purple head is worth the wait. These two definitely contain more antioxidants than the white types. The standard in Hawaii for decades was **Snow Crown**, but there are many new ones around. Heat-tolerance is a must when selecting a variety for Hawaii, even in the uplands.



Cauliflower, Graffiti - Molokai Grown

Kale: Kale is starting to catch on in Hawaii, and the one is the best adapted to our climate is **Lacinato**, also known as Toscano or Dinosaur kale. The most heat tolerant of the kales, leaves are blistered or savoyed which give it a 'prehistoric' look. **Lacinato Rainbow** is a cross between Lacinato and Red Russian and does well in Hawaii with plants pulling toward each parent and everything in between. A variation on the theme is a kale crossed with broccoli called **Purple Peacock** in which the whole plant can be consumed, from the purple head to leaves and stems. The leaf design is kind of gothic.

Edamame or Edible Soybeans: An island pupu staple that's going viral, edamame is a great healthy snack. Two varieties that are on and productive include **Beer Friends** and **Midori Giant**. A very unique variety is **Korean Black** with a black covering on the seed. A teriyaki sauce with chilipeppers, and sesame poured over a batch of boiled or steamed edamame makes the perfect pupu. At one time, the old favorites were **Early Hakucho** in the 1970 and 80's, and **Bansei** in the 1960's



Tipburn on Manoa Lettuce

Lettuce: In the late Hawaiian summer, a combination of hot days with warm nights creates havoc for the growing of lettuce. These extreme conditions cause bitterness, tip burn on leaves, and early bolting for even the toughest lettuce. Batavian types such as **Sierra, Nevada, Concept, and Anuenue** are among the leafy types that can weather the heat, and are the standards that others must match up to before they can be called heat, tip-burn, and bolt-tolerant. Some super heat-

tolerant standards developed for greenhouse production were **Rex** and **Ostinata**, and

can be used to develop new heat-tolerant cultivars. Another way to beat the heat is to grow baby lettuce, ready in 30 days. In that case, you can choose from an array of colors and types. If you must have lettuce in the heat of summer, try a screen or Reemay cloth the top of the row to cool them or plant it in a shady area. Misting them a couple of times a day can help to keep them cool and happy. Full sized romaine types are always in demand, and a great heat-tolerant variety is **Helvius**, tested on Molokai in the heat of summer. Some trials were just completed at the Poamoho Research Station on Oahu, and probably a bunch of new varieties have been tagged.

Head Cabbage: Times, they're a changin' due to increased insect pressure in Hawaii. The Diamond back moth has been able to overcome a lot of pesticides, and as a result, production farmers have moved away from the sweet types such as **Tastie** to the more cast iron types like **Scorpio**. Some of the old standards are still the best, including **KK Cross** which has been around for decades and also **KY Cross**. The flat types seem to be more tolerant to stress and insects. At one time, all cabbages had to be a perfect globe. Pointed cabbages are starting to catch on, but I haven't tried them yet. Earliness also helps to beat the insect rush, but taste is still important especially for alternate markets.

Eggplant: Some like it round, some like it short, and others like it long. Skins can be white, pink, purple, black, green, or striped, and they come in all shapes and sizes. We eat it fried, tempura style, curried, sauteed in garlic, and even pickled. Eggplant has many cooking uses, but in Hawaii, long purple eggplants rule, and **Nitta Waimanalo Long Hybrid** and **Nitta Molokai Hybrid** are the ring leaders. Nitta is the cast iron of long eggplant originating from East Molokai and is believed to come from the Philippines. Due to its multiple fruiting habit, it can produce twice the yield of Molokai Long and Waimanalo Long.

Molokai Long is believed to have come from a Molokai farmer, while Waimanalo Long is a UH cross between Molokai Long and Takii Long Black with increased resistance to foliar diseases.

Green eggplant is a recent introduction to Hawaii from Southeast Asia, and the one to beat for sweetness and yield is **UH Long Green**, but for some reason this color hasn't caught on by mainstream consumers except for restaurants who use to prepare Garlic Eggplant dishes. Organic growers prefer **Pingtung Long**, a beautiful light purple-lavender long eggplant from Taiwan with clean white flesh. **Farmers Long** is another



A mix of Nitta Hybrids, Pingtung Long, and Farmers Long Eggplant

variety from Taiwan that's high yielding variety and can get 18 inches long. It's also lighter color than the Nitta series and can be picked young for markets preferring smaller long eggplant.

Baby eggplant is a specialty crop with specific uses, including baby vegetables for upscale markets. **Little Finger** is a popular organic variety and is picked at a small stage of 6" or less. It has a multiple fruiting habit for high yields. Not all eggplant can be picked young, but Little Finger is firm and won't shrivel on the shelf. Pickled eggplant is another product unique to Hawaii in the U.S., originating from Japan and Okinawa, and **Lahaina Nasubi** is the favorite. Harvested at an early stage, the seed is not that easy to find, being held by families who enjoy eating them, but is worth finding and making seed to keep this heirloom alive.

Carrots: Carrots can be a real challenge when growing them in Hawaii because some can have a strong turpentine or terpenoid taste, influenced by the soil composition of our 140 soil types. Some consumers like it sweet, while others prefer a great carrot taste. Depending on who you ask, there's a spectrum of favorites from old standards like **Danvers Half-Long** and **Red Cored Chantenay** to more recent developments such as **Bolero**, **Mokum**, **Nelson**, and **Napoli**. New colors are on the horizon, and some are more focused on skin color and less on taste. **Dragon**, a red carrot developed by Washington State University organic vegetable breeder John Navazio, has better taste than other reds such as Cosmic Purple. Another improved red-purple carrot is All-America winner **Purple Haze**. A multi-university research effort coordinated by Dr. Phillip Simon is developing organic carrot varieties with resistance to root-knot nematodes, larger tops, and increased sweetness. New color development is driven by an interest in increasing the anti-oxidant content in vegetables, and providing a broader palate for discriminating tastes. Carrots are a success story in how to eliminate Vitamin A deficiency in the modern world. An important tip when growing for the family is to harvest early so the last ones to harvest are not over-mature.

Pak Choy: A very popular Chinese vegetable in Hawaii, there are two main types; the Shanghai or green stem (varioles), and the Canton or white stem. The two main varieties are Shanghai-type **Mei Qing Choy** with a flat light green stem and the Canton-type **Joy Choy**, with a white stem shaped like a celery stalk. Dwarf varieties are gourmet delights, including **Toy Choy**, **Bonsai**, and **Li Ren Choy**, and are quick to prepare in a stir fry or steamed with chicken or pork. You can harvest the minis in 30 days if you take care of them.

Asparagus: California varieties do the best in Hawaii and there's many to choose from. The two main production varieties in California include **De Paoli** and **UC 157 F1**. Other California selections to try include **Apollo**, **Atlas**, **Grande**, and also **Purple Passion**, my favorite with large purple spears that's big and sweet. If you boil it, the color will change to greenish, but steaming will retain some of its color. Blanching might be better

in order to retain its beautiful purple color. Males produce larger spears, while females produce seeds so you can grow more asparagus without buying seed, so it's a trade-off, but for serious production, you gotta go with the males. Some seed companies are starting to offer all-male seed. Planted from seed, you can harvest pencil-sized spears in a year, but they'll get bigger from then on if you control weeds and keep the ferns healthy.

Butternut Squash: A new winter vegetable to fill the winter slot when the mainland stops shipping them in, the scourge of this crop is powdery mildew, a whitish fungus that can decimate leaves and lead to lower yields and early death. Research in the East has created new mildew resistant varieties, including **Amber Delight**, **Honey Nut**, and **Bugle**. More resistant varieties with improved shape and uniformity, as well as better shelf life are in the pipeline. Manipulating the size to about 2 to 2½ pounds is important in targeting local market demands especially for organic markets.

Potatoes: I was talking story with Maine potato growers Jim Gerritsen and also his two young sons this past February and he tipped me off to some gotta-try potatoes, including **Island Sunshine** and **Elba**, but it really comes down to what you're gonna use it for. I grow **Yukon Gold** and **Red La Soda**



Molokai Grown Red La Soda Potatoes

because I have access to seed that I maintain, but I like **Chieftain**, a heavy yielding red. Some of the fingerlings are very heat-tolerant and the last ones standing in the heat of summer in a dryland system, but is late maturing. Ones to try include **Russian Banana**, **La Ratte**, and **Swedish Peanut**. Yellow flesh is IN and there are so many different varieties, but the gold standard is still Yukon Gold, an all-around potato great for fries and hash browns, or even just baked, but is not a good yielder. A seedling of Yukon Gold, **Yukon Gem** is higher yielding, and a little later maturing, and the flesh is a brighter yellow.

Breaking Hybrids

Hybrids combine two open-pollinated or inbred lines for many reasons, including uniformity, increased disease resistance, taste, color, or intensifying a certain characteristic, among many other attributes. They may be related lines or ones quite different. If you save seeds from a hybrid, what you have is the F2 generation representing the spectrum of mother to father traits and everything in between. In the past, it was a no-no to save hybrid seed, but this is changing especially in organic

systems because many farmers want to save seed and select attributes for their specific farm environmental conditions.

Organic farmers save seed for many different reasons, including seed security and accessibility, crop improvement, and assuring that your seeds are not contaminated by genetically-modified pollen, which can be a problem if you have conventional farmers growing genetically-modified seeds nearby, but this applies only to corn, soybeans, sugar beets, broccoli, squash, and alfalfa for now, but watch out because many more crops are awaiting approval. For example, organic corn growers are presently facing widespread seed contamination in the U.S. corn belt, especially corn seed growers.

The advantage of breaking hybrids is to create lines for your specific location, soil type, farming system, and market preferences. By growing out F2 seed in the worst possible weather conditions, you can select for disease tolerance, while growing out in a low input system will help you identify ones that are more efficient at utilizing soil nutrients or ones with larger, scavenging root systems. Continued refinement will help you develop what you feel are the most important attributes for your farm system. You need to remember that selecting for one attribute may mean selecting away from something else, and it may not be clear what that attribute might be. Earliness? Yield? Compact growth?

One example is the hybrid long purple eggplant Nitta X Molokai Long and Nitta X Waimanalo Long. Since seeds are in short supply during certain times of the year, it may be prudent to grow out the F2 and select for attributes important to your production system. I would first select for multiple fruiting, an important characteristic which makes this variety high-yielding. Where one fruit will emerge on a stem on a Waimanalo Long or Molokai Long, Nitta will have two fruit.

Another attribute is plant structure. Nitta is a robust plant with a large trunk diameter, giving it some wind tolerance and the ability to hold a lot of fruits without falling over in rainy conditions. Another attribute is fruit shape and diameter. Long, skinny fruits have a better chance of curling, rendering it an off-grade product sold for a lower price. Looking for the ideal fruit size depends on your markets. Around 8-12 inches long with a 2 ½ inch diameter fits many markets. Walking through a field and selecting for these attributes can help narrow down the selections. Another important attribute is color, found in the other parents, Molokai Long and Waimanalo Long. The Nitta strain has a dull brown-purple color that's not very appealing. Selecting for color is something down the list of priorities after yield, shape, and plant structure.

It's not a good idea to select from one plant because you may not be able to see all its other attributes in one season. Making 5 to 10 selections helps to narrow it down, and allows you to do a more in-depth selection the next season. Maintaining a seed mix of all the selections allows you to go back to the source if the weather changes on you,

which is happening a lot lately. With a year-round growing season, plants may thrive in one season and not in another. As a whole, eggplant doesn't do well in winter months, and some selections will exhibit more disease tolerance than others, especially foliar disease. This is important if you're planning to grow through the winter months.

Another attribute is how the plant recovers after pruning, an important strategy to deal with an up-and-down market. When the demand is down, and there are too many eggplants on the market, it's a good time to prune plants back and allow them to flush, moving production peaks forward by a couple of months. Every crop will have different selection priorities, but this is how you start to create a variety for your specific needs and climatic conditions. Then you can name it yourself or after yourself.

SQUASHED

I've heard squashes referred to as 'eggs of the earth'. Squash is old stuff, and was domesticated before corn and beans over 8,000 to 10,000 years ago. It's native to a broad area from the southern U.S. to South America, and from there moved across the continent probably to Canada down to the Chile. Squash is a modern introduction in Hawaii, and Hawaiians considered squash one of the hidden fruits planted in the 'Huna' moon phase where the sharp tips of the moon 'huna' or hide. I consider it hidden treasure and vital for food storage and food security because with it, you can feed yourself today, tomorrow, next week, next month, and even six months from now.



Cucurbita moschata 'Crowning' with cousin Hyotan or Bottle Gourd, *Lagenaria siceraria* (background)

There are different meat textures, from grainy, stringy, and smooth, and flesh colors from white, green, yellow, and orange. Skin colors are even more varied, from white and yellow to brown, two-toned, to red and orange. Sweetness is a function of storage, and some species are very exacting in their requirements, including warm and cool storage to cure them. For some varieties, their sugar content will peak after three months.

There's a lot of debate on how many species of *Cucurbita* exist. Some are more wild types, while others have been under cultivation for a long time. Some squashes were grown for their high protein seeds. We use the name 'pumpkin' 'squash' and 'kabocha' interchangeably, but there are species where these names fit better. There are many land races in Hawaii introduced mainly from Southeast Asia, especially the Philippines, and they come in all shapes, sizes, and tastes.

We use squash and kabocha in stews such as pinakbet, pork and pumpkin with long rice, or steamed with soy sauce and mirin. I even make pumpkin pie out of some of them, including **Crowning**, a high yielding squash with a flat fluted shape I brought back from Taiwan. I planted one seed and ended up with 65 pumpkins or squashes, from 6 to 12 pounds each and stored it in an old Dodge Caravan. I've given this seed out in many seed exchanges throughout the state.

The three main squash species include the following:

Cucurbita pepo: Includes acorn, cocozelle, crookneck, pumpkin, scallop, straightneck, vegetable marrow, zucchini, and ornamental types.

Cucurbita moschata: Includes Calabaza, Butternut, Field Pumpkins, Seminole, Tromboncino, and Long Island Cheese pumpkin. These are considered a more tropical species.

Cucurbita maxima: Includes kabocha, giant pumpkins, Lakota, Arikara, Buttercup, Banana, Candy Roaster, Uchiki Kuri, Boston Marrow, Hubbard, and Turk's Turban.

Kabocha or Japanese squash resembles buttercup squash but without the characteristic cup on the blossom end. Brought to Japan by Portuguese sailors in 1541 from Cambodia, they called this squash *Cambodia abobora*, but it was shortened to kabocha by the Japanese. Kabocha is a favorite in Hawaii and can be distinguished from other squash by their characteristic large fat handles, their extra thick seeds, and their dark green color, although some are bluish, or dark blue with silver white stripes and flecks. Averaging 2 to 3 pounds, kabocha can be as large as 8 pounds. Recently, crosses with the Japanese variety, Ichiki Kuri has created bright orange-skinned kabocha, including Sunshine F1 developed by Johnny's Seed.

Kabocha is rich in beta carotene, iron, Vitamin C, and potassium, and the darker orange the flesh, the higher the beta carotene or Vitamin A. Kabocha is cured to bring out its sweetness. When first harvested, they're still growing and require about 2 weeks at warm temperatures of 77 degrees F to convert the starch to sugars. It is then stored at a cool temperature of 50 degrees for a month to increase its starch content. It will reach its peak of sweetness in about 1 ½ to 3 months after harvest. This is what makes it a good shipping product, and tons of kabocha are shipped to Hawaii from New Zealand during the cold months when it's summer in the Southern hemisphere. This attribute also made it easy to move around in ships in the age of exploration.

Many native American tribes had closely related varieties, and it was an important food because it could be stored. Varieties of the same species include Arikara from the native American tribe of the Dakotas, Lakota from the Sioux nation, and candy roaster

from the Cherokee of the Appalachians. All giant pumpkins are of this species, but are not technically pumpkins.

Something I just learned; squashes are usually classified as winter or summer squashes. Winter squash is eaten when mature and when seeds are solid and can be used for planting, while summer squashes are those eaten when immature such as Zucchini, Crookneck, and Patty Squash. If we could only get a handle on some of the insects and diseases, and also sufficient bees to pollinate the flowers, we could grow a lot more squashes.

Some of the diseases include powdery mildew, a fungal disease that wipes out the leaves, but the viruses are the worst, including Watermelon Mosaic Virus II, Zucchini Yellow Mosaic Virus, and Cucumber Mosaic Virus. Spread by aphids, they can severely stunt and kill plants. Whitefly-vectored viruses include Silver Leaf where leaves have a silver sheen to them. Once plants contract a virus, they will head downhill and create unsaleable, deformed fruits, but there are differences in susceptibility between the different species. Insects are many and include the dreaded Melon Fly, melon thrips, pickle worm, aphids, mites, and probably more.

With all the diversity of squashes we have in Hawaii, brought here by many cultures from their homelands mostly in Southeast Asia, we should be developing our own varieties for Hawaii, especially winter squash.

A Closing Thought

“Don’t fear perfection, because you will never achieve it.”

Salvador Dali

Well, back to the drawing board. That’s all for this month. The time to start planting is now! If you’re interested in reading some of the back issues of this newsletter from January 2013 to March 2014, just go to:

<http://www.ctahr.hawaii.edu/SustainAg/news/index.html#NewFarm>

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