
Growth of Chaya in Different Climates

In EDN Issue 72, we asked readers how chaya grows in various climates; whether or not it is accepted locally as a green vegetable; and if so, how it is usually prepared and served. Thank you to those of you who responded!

We received reports from many different countries. Chaya has been found to grow remarkably well in a wide variety of climates.

Nancy Harper, working in Belize with Systems of Sustainability, wrote, "We have used chaya for the last ten years as our principal and preferred year-round source of greens. It tolerates lack of care, quite a bit of shade or full sun, and invasion by weeds. Few pests bother it, it is highly resistant to just about everything, and it produces a prodigious amount of leaves, even in the dry season, if given a little compost and mulch.

"After a few years, if not mulched or given compost, chaya can begin to die out, especially during prolonged drought. I believe it is a [viral disease] carried by an insect. As soon as I see these insects on the underside of the leaves and note the fading, sickly leaves, I take cuttings from the healthiest-looking plants and replant them in good soil with compost and mulch. This only happens when plants are heavily cropped, underfed, and dry.

"Besides compost and/or mulch, chaya enjoys wood ash (in our acid soil) and dilute urine...We can grow a lot of other greens, especially in the cooler months, but chaya never fails. Plant lots, everywhere you have space! Even our cats love chaya."

Carlos Echavez, Executive Director of Bol-anon Foundation in the Philippines, wrote the following: "On your request of chaya feedback. We requested planting materials of this plant years ago. It is vigorously growing but we only use it for mulching material and as a living fence instead of eating it." [see further comment below, in next section.] Jay Ram wrote to us from Hawaii. "We have been propagating chaya in Hawaii and spreading it throughout the Pacific area for a number of years. We have observed the following:

"The 'spineless' variety [Ed: the variety with no stinging hairs; see end of paragraph] of chaya has been a persistent and vigorous perennial which thrives in high rainfall areas of 150-230 inches per year. No diseases have been noted. However, if an older plant is coppiced [cut back] too close to the ground, the entire plant can succumb to what probably is a fungal or bacterial rot which enters through the wounds. Some of our plants have been continuously coppiced for 12 years, and are still vigorous. Coppicing seems to work best when the new cut is made just above the previous one, which makes the plant height eventually higher. If the new shoots are

not consumed and [are] allowed to grow, [we coppice] every 2-3 months in this high rainfall climate, as growth is very rapid. Plants will grow to 8 to 10 feet [2.4 to 3 m] in that amount of time. Note that this rate of growth is without any external inputs of nutrients or anything else. Growth is also rapid in the winter season when temperatures are somewhat lower. Thus in this climate, aside from being a good food source, the plant is a great biomass producer as well. We also grow the chaya variety that has spines, for germplasm purposes [i.e. for genetic diversity]. It may be somewhat more vigorous than the 'spineless' variety." [Ed: They are actually stinging hairs, rather than 'spines.']

Charlie Forst, Appropriate Technology specialist here at ECHO, pointed out that for maximum production of tender leaves and 4 to 6 inch new shoots, you should pollard chaya (i.e. cut back the larger limbs and upper canopy to about 4 feet) rather than coppicing it (cutting back the whole plant, including the stem, to around 18 inches).

Tim Bootsma with CRWRC-Zambia wrote to us about how chaya grew in Eastern Province, Zambia. "We received the chaya cuttings in January, 2000. They all arrived safely. They were potted and all six cuttings grew well. Two got eaten by my dog, though; she liked to dig in flower pots. By March the [rest of the] plants were ready to plant out.

"In Zambia we have a four-and-a-half month rainy season that begins in mid-November and goes till the end of March. Then we get no rain until the following November. Our chaya plants were ready for transplanting in March, just at the end of the rains.

"Three plants survived the transplanting and early care. These three were planted in three different locations. One was way up on a dry hill, the second toward the high end of a gardening area (where water is close to the surface), and [the third] in a wetlands/lowland area. They all grew well until this past rainy season, when the one in the lowland got waterlogged and died. The other two did better, with much more vigorous growth on the one grown in the garden area in reach of more soil moisture.

"The one in the high area kept getting attacked by local chickens. At times it was plucked bare, with no leaves left but just a stem. It struggled, but it survived.

"One year after they were planted, the two remaining plants are about 6 feet tall... The two chaya plants are still teaching us new things. One plant is flowering, and we want to see if it will produce seed. [Ed: Our chaya flowers almost continually. One plant produced a few seeds once in 21 years.] The facilitator who has taken over the care of the chaya also wants to monitor it a bit longer to see when will be the best time to harvest the leaves. They have noticed that at some times the leaves are softer than others. The chaya is still being monitored to see how much trimming and cutting and abuse it can take. One of the two plants was accidentally chopped down by an eager person trying to clean up the garden. Since then it has started [sending up new shoots]."

Grant Kaufmann wrote from Villamontes, Tarisa, Bolivia, "Dear ECHO, in response to your question about chaya in EDN: We have subsequently started chaya at two locations in Bolivia: 1) Santa Rosa, 17 S latitude, tropical wet/dry (three month dry

season), 1500 mm [60 in] precipitation, 300 m [1000 ft] elevation and 2) the Chaco, 21 S latitude, subtropical dry (six-month dry season), 600 mm [24 in] precipitation, 600 m [2000 ft] elevation.

"The cuttings were hard to start at Santa Rosa because of fungus problems but once established the plants did well. In the Chaco the cuttings took well and had good first season growth. The plants frosted off at ground level but quickly regrew with the first rains."

John de Wolff, Dar es Salaam, Tanzania, wrote, "Concerning your question on chaya, I received in the past cuttings. Cultivation is easy and I have a nice stand. During a drought of six months it lost most of its leaves but now after some rains it has re-sprouted very well. A very easy crop to grow and I have not yet seen any diseases or pests."

Marsha Hanzi at the Instituto de Permacultura da Bahia, Brazil, wrote, "I brought chaya stakes back from an ECHO conference some years ago, and I now have enough to give away as many as people want. It has adapted to our garden in tropical Northeast Brazil, and also to the drylands, when planted in the vegetable gardens there. It is always a bit puny the first year, but takes off after adapting to the new site.

"It really does better in the dry season than in the wet, and gives better planting results in drier weather. (In the wet the stakes tend to rot.) This is fine, as we have a lot of semi-wild leaves for the wet season, but very few for the dry."

She added, "Chaya has the great advantage of being immune to leafcutter ants...it is totally pest-free, slow to establish but extremely resistant when well-rooted...We have spread it all over the place, in both humid climates and in the drylands, where it does well in the vegetable gardens as a green fence."

Later, Marsha wrote, "Chaya continues to spread and take hold here—even people who don't normally like vegetables like it. It has done well in the drylands gardens, and is into the fourth generation now. It is really a fantastic plant!"

John Freeman works in Nicaragua. He wrote, "Your chaya is doing very well...Sadly, the recent hurricane floods wiped out certain seed stocks we had...but the chaya lives on as it was firmly rooted and they all are over eight feet tall."

Deborah Kuiken in the Dominican Republic wrote, "We are very excited about the chaya. As a Peace Corps volunteer in a very dry and poor village, I believe chaya has great potential to improve nutrition here. Our agricultural trainer, Robert Crowley, took some chaya cuttings to Bani (where he lives). The cuttings will be transplanted at a nutrition center for mothers with malnourished children."

Figure 2: Susanna Hall (left) and Ruth Beverly picking chaya at the Old Bight Mission Home on Cat Island, the Bahamas. Photo by Danny Blank.

Chaya also has done well on Cat Island in the Bahamas, where the ground is mostly limestone, resulting in very difficult growing conditions for plants (see Figure 2). Since the picture in Figure 2 was taken, the chaya plants have grown to more than six feet tall. The leaves are harvested once every two weeks and prepared in a soup to be served to about three dozen orphans and workers at the Mission Home.

Is chaya locally accepted as a green vegetable?



It is encouraging to read about chaya's vigorous growth in different climates. But chaya's value is limited unless people actually use it as part of their diets. We wanted to know how chaya was accepted locally as a green vegetable.

Carlos Echavez (Philippines) wrote,

"People are afraid to eat it considering that its cousin plant—the cassava—can cause poisoning. Can you give us more advice on this to avoid incident of poisoning?"

Jay Ram (Hawaii) said, "Interestingly, a wild variety of chaya (with stinging hairs and narrower leaves) was introduced to Hawaii some decades ago by the government as an alternative perennial vegetable. It never became popular (no doubt due to the stinging hairs), but can still be seen growing wild in the form of trees in some places

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"Some years ago, we introduced chaya to the Marshall Islands, Federated States of Micronesia, and Fiji, where it was well-received. Farmers in Fiji were so pleased with this vegetable that they somehow disseminated it on their own (probably through family) to areas of Vanuatu, where it is now established. I suppose that is the ultimate positive reinforcement for someone involved in development work who enjoys introducing new species into different regions."

James Golden working in Belize, also wrote to us about chaya with stinging hairs. "For years, the only chaya trees here had stinging nettle on the bottom side of the leaves and on the tender shoots. When the stinging nettle came in contact with the skin, it really stung and itched. If you were to place one of the leaves on the tender part of your forearm, it would set you on fire for hours. [However,] even with the stinging nettle on the bottom of the leaves, poor people here grow it and eat it. They always handled the chaya by the stem that is between the leaf and the shoot. They were careful not to let the bottom side of the leaf come in contact with the skin. When it is boiled, it no longer stings like nettle."

[Charlie Forst at ECHO agrees. He says the stinging-haired chaya (often referred to as 'chaya brava') is as useful as the non-irritating chaya ('chaya mansa'). Use a glove or cover your hand with a thin plastic bag when picking chaya that has stinging hairs, or cut the leaf petioles with scissors and let the leaves fall into your basket. Cooking for 10 to 20 minutes eliminates irritant hairs.]

James Golden added that a new variety of chaya without the stinging hairs was introduced into the area of Belize where he lives and works. He demonstrated to many people in the area that this chaya didn't sting, by placing the bottom side of the chaya leaf on his arm and witnessing the amazed expression of his neighbors!

Tim Bootsma in Zambia wrote, "Chaya was cooked up and eaten by our volunteer agriculture promoters—13 people in all. They all liked it very much and want to grow it in their gardens this year.

"After the initial introduction, it looks like chaya could spread fast in this area. Farmers like the taste. It is quite a conversation piece. When farmers come, they often ask about what this plant is. It sparks a lot of curiosity. Until now, however, it has not been openly promoted... .Thanks for your help in sending us chaya. We hope and pray that chaya may soon be spread through Eastern Province!"

Grant Kaufmann in Bolivia wrote, "In neither location [Santa Rosa or the Chaco; see previous section] could we persuade people to eat the leaves, as "greens" are not a normal part of their diet. We "gringos" (foreigners) enjoy them, however— especially the women, who consider the local diet seriously short of green vegetables."

Jorge Lupitou R. wrote to us from Guatemala. "Here [chaya] also goes by the name "chatate," but unfortunately its consumption is not common. At home we add it constantly to our rice that they may cook together, and in tamales it is delicious. Too bad the cyanogenic glycosides won't permit the use of raw juice, for chaya juice could be the ideal supplier of chlorophyll, protein, etc."

John Freeman wrote that in Nicaragua, "About half the folks hate it, but others love it. I plan to work on drying chaya leaves to be added to soup, as (it) may taste different and be accepted by all. The traditional dish is a sort of rice and meat soup called "luk-luk" in the Miskito language. It could use some vegetables, so I hope to introduce chaya leaves as an addition.

John de Wolff in Tanzania said, "Because of my warning that unboiled leaves are poisonous, people did not take it...I am eating it but my family does not consider it as nice as the normal amaranth species here. Could you include cooking advice on this edible leaf?"

Indeed we can! Some of our readers wrote to let us know how they or people in their area typically prepare and serve chaya. Perhaps these ideas will inspire experimentation by others!

Nancy Harper in Belize said, "Central Americans usually fry the leaves with eggs and tomatoes. But I prefer to boil them first to be sure to remove HCN [Ed: the small amount of poison boils off as a gas]. The cooking water is a delicious tea, warm or cold, and is very good for high blood pressure. The boiled leaves can be drained (and squeezed if you want to remove all the water) and served like spinach, or fried with oil, salt, onions and garlic. Peanut meal or peanut butter is a very good addition, as are mustard, soy sauce or miso. The leaves are also good cooked in coconut milk with ground foods like potatoes and yams or breadfruit.

"Our favorite sandwich is to spread peanut butter on a warm cassava and flour tortilla, pile on the cooked chaya, and roll it up like a burrito. The cooked leaves can also be put in any kind of tortilla or bread dough. All children will eat bread or tortillas and can thus get their greens at the same time. Chaya can be used in any

recipe that calls for cooked spinach, including lasagna and even pizza! The stem tips are very delicious, boiled and peeled. You can cut about 4 to 6 inches, depending on growing conditions. Remove the tough, longitudinal fibers after cooking.

“While moringa also produces all year round and is relatively care-free and resistant [to pests and diseases], it can’t compare with chaya for ease of harvest and preparation. And we find moringa a little strong-tasting for everyday consumption.”

Marsha Hanzi in Brazil said, “We eat it here as kale is eaten: cut into paper-fine strips, and stir-fried with garlic and ginger. [It needs to be cooked] longer than kale because it is more fibrous. I imagine that the very very fine cutting helps to dissipate the acid. It is delicious this way...” Sometimes chaya is blanched before it is stir-fried.

Some Other Uses for Chaya

Marsha Hanzi wrote, “It is...interesting to note that [chaya] is excellent chicken fodder, and can be used in permanent chicken forage systems, cutting whole branches for them to eat. We have observed that access to greens increases egg production. [Ed: Access to greens also makes yolks a darker yellow]

“David Kennedy (Leaf for Life) also points out that it is excellent as a source of dried leaf meal [as a nutritional supplement]. It could be an excellent addition to animal feed in the dried form as well.

“It is also an excellent mulch material for vegetable gardens, when planted in hedges. The high mineral and nitrogen content really favors demanding vegetables.”

Chaya cuttings will be available from ECHO in May, 2003. Our current stock is low due to the discovery of a virus in our chaya plants; several months ago, we discovered that most of our chaya plants contain the common cassava mosaic virus (CCMV) (Note: this is NOT the same as the common cassava virus that can devastate cassava crops in Africa!). We know of no published studies indicating that CCMV can jump from chaya to other crops. A study we read indicated that around 70% of chaya trees sampled in the Yucatán (believed to be the center of origin of chaya) carried CCMV. Chaya (presumably with CCMV) has been grown on ECHO’s farm for twenty years, but to our knowledge our cassava plants remain virus-free. Nevertheless, we would rather send out virus-free cuttings. We have virus-free plants, but they are still too small to provide cuttings. They will probably be ready by April or May). We are also working with a tissue culture scientist at College of the Ozarks to culture virus-free plants by meristem tissue culture.