



Ceratozamia hildae

"Bamboo Cycad"

Photos by Bart Schutzman (unless otherwise noted).

Cultivation of *Ceratozamia hildae*

by Tom Broome

C*eratozamia hildae* is my favorite landscape cycad here in Florida. It has an upright habit that is different from most other cycads, which have more of a fountain form. It can be grown in a smaller spot so it makes a great accent plant in a larger landscape, but can also be a specimen plant in a smaller landscape. The leaflets are grouped in unique bowtie-shaped clusters. Typically the species has green-emergent leaves, but a few rare brown-emergent individuals exist in collections (which I find very attractive).

This species is easily grown in all of Florida. It reacts well to fertilizer applications. I have had four flushes of leaves in one year on several individuals in my nursery. They also mature fairly fast; males mature in less than five years and females come in five to six years. I have found that a plant with a four-inch stem diameter can produce a cone. *Ceratozamia hildae* is best grown in partial shade. A plant grown in full sun will actually grow very fast, but never looks very good. The sun seems to bleach out the leaves and makes them look yellow or burned. If they are grown in deep shade, the leaves will look good, but plants will grow much slower and look a little thin. *Ceratozamia*s seem to prefer a little more water than some cycads, but as with other species, good drainage is just as important. This species has an underground stem, so drainage is important if it is grown in a wet area. Mounding may be needed if the ground is often saturated. This *Ceratozamia* is very cold hardy and should work well in any part of Florida. I have known of plants in Florida that sustained no leaf damage after a freeze of 14F. I have known of other plants in Texas that had no leaf damage at 12F. Even with leaf damage, the plant should survive temperatures much lower than this because of the underground stem, but I have never heard of this species tried at temperatures below the low teens.

Most cycad species have a three to four week window each year when female cones become receptive and male cones shed pollen. *Ceratozamia*s in gen-

eral are different. All the species I have worked with have an extended receptivity period ranging from as early as January to as late as June, with everything in between. This makes it a little harder to pinpoint the exact time for each plant. I have to check all my plants every two or three days during a four month period to make sure I haven't missed anything.

Ceratozamia hildae is a very attractive cycad and is easy to grow. This plant should be on every new collector's list of cycads to try out. It can get to be seven feet tall and grows rapidly compared with many cycads, which is very rewarding for anyone new to rare cycads.



Immature *microstrobilus*.
Photo by MBC.



Megastrobilus.



Young seedlings of *C. hildae* do not have fasciculated leaflets.



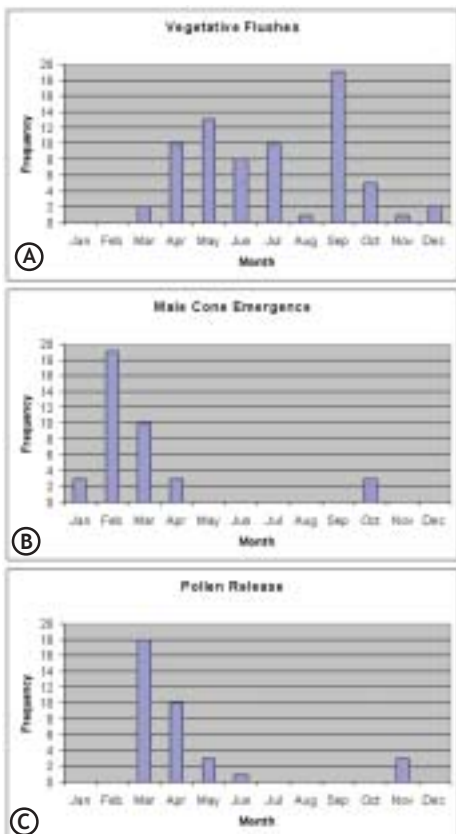
This well-grown plant is already highly branched. Photo by Fe Almira.

Phenology in South Florida

by Jody Haynes

Montgomery Botanical Center (MBC) currently has 187 cycad taxa, 1,414 accessions, and 2,688 plants in our ground collection, and at present, we collect monthly phenology data on more than 1,500 plants.

Although we have fewer than 20 plants of *Ceratozamia hildae* in the ground, we are able to report some trends for this species as it grows in our subtropical climate and limestone-derived soils. Plants flush twice and rarely three times per year, primarily in May and September (Fig. A below). Although there is some variation in flushing times, individual plants usually exhibit cyclical flushes from year to year. Male plants cone once and rarely twice per year, usually beginning in February or March (B). Pollen is then released approximately one month after cone emergence (C). Although our sample sizes are small for female reproductive phenology, our data suggest that female plants cone once per year in January-March, become receptive from April-July, and mature in February or March the following year. Rarely, a female plant may cone in September and produce mature seeds the following September.



A-C. Vegetative and reproductive phenology of *Ceratozamia hildae* at Montgomery Botanical Center, Miami, Florida

Taxonomy & Nomenclature

by Bart Schutzman

Often times by coincidence a species is discovered and described by different botanists within a short time of one another. When this happens, the botanical rule of nomenclatural priority applies; the first validly published name for a species has priority over later names, which are regarded as synonyms. This can cause confusion when both names are being used in the horticultural trade. This nearly happened in the case of *Ceratozamia hildae*. The paper by Dr. Andrew P. Vovides and John Rees describing the species (they were going to use the name *C. fasciculata*) did not get to press before Garrie Landry and Marcia Wilson's description came out in *Brittonia* in 1979. Therefore, it was not used by horticultural people and did not result in this kind of confusion. The authors wisely decided to cease publication of their paper, and instead in 1980 published "Datos adicionales sobre *Ceratozamia hildae* Landry et Wilson, 1979 (Zamiaceae)" in the Mexican journal *Biotica*. So a fine addendum to the Landry and Wilson paper resulted, with excellent illustrations (below),

habitat data, and comparison to a nearby species, *C. zaragozae*. The plants described by Landry and Wilson were originally brought from the wild in 1960 by Luciano Guerra, a well-known plant collector, and were growing in Baton Rouge, Louisiana in the garden of Dr. Walter Harman (the founder of the Cycad Society; see his obituary in *the Cycad Newsletter* 25[2]:11). The name *C. hildae* was derived from the latinized form of "Hilda," the name of Mr. Guerra's daughter. The plant had been known by *Ceratozamia* "Hilda" informally in the horticultural trade since Guerra's introduction of the plant.

In the trade, one can find plants labeled *C. hildae* that are only sparingly fasciculated, i.e., they don't have much of the leaflet clustering that Tom Broome speaks of. Many of us believe that this species naturally hybridizes with another *Ceratozamia* growing nearby, considered by some to be *C. latifolia*. Only further research will tell 1) what species the other purported parent is, and 2) whether *C. hildae* hybridizes with this nearby species or if the differences merely reflect natural variation in *C. hildae*.

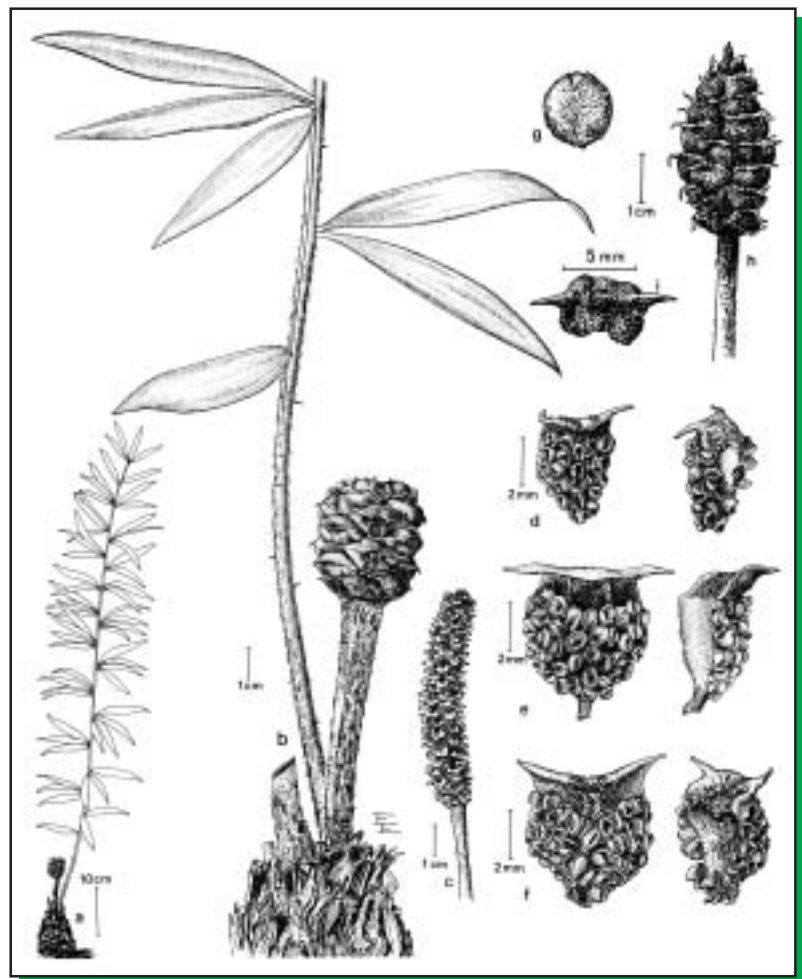


Illustration of *Ceratozamia hildae* in Vovides & Rees' 1980 paper

How the Scientific Description of *C. hildae* came about

by Garrie Landry

In 1975, my first year in graduate school, I knew I wanted to work with cycads in some capacity and began looking at potential taxonomic projects. I was essentially on my own with minimal guidance, as there were no true cycadologists of that day to confer with. Initially my interest focused on *Ceratozamia*. I relied heavily on my advisor and friend, Dr. Walter Harman, for suggestions and support for the ideas I had about working with this genus.

The project seemed feasible at first, for here was a genus that was confined geographically to Mexico and Guatemala. Furthermore, the number of known species appeared to be a reasonable one to pursue based on a preliminary search of the literature. I familiarized myself with the then-known species of *Ceratozamia* and quickly discovered that there were less than a dozen described species, but so many horticultural names that the idea of resolving some of these potentially unknown or misidentified species became the premise for a research project. I was too naïve to realize the extreme complexity of *Ceratozamia* and that a revision of the genus was far beyond the capabilities of a master's degree project. Nevertheless, I pursued my interest in *Ceratozamia* by visiting botanical gardens and herbaria to see their specimens. A small Sigma XI grant partially funded a trip to visit the national Herbarium in Mexico City (MEXU) where I studied and photographed specimens for later comparisons with horticultural specimens. Several trips were made to Fairchild Tropical Garden (FTG). There I met with Stanley Kiem, Crafton Cliff, Nina Woensner and Mary Collins, who were very generous with their knowledge and time. The garden's collection was without a doubt the best in the eastern US, affording me the opportunity to observe many mature cultivated specimens. During that time, which coincided with the inception of the Cycad Society, I met many knowledgeable people, among them the late Marcia C. Wilson of Brownsville TX. Marcia and I became great friends and I thoroughly enjoyed my visits to her home, each time learning more about the complexity of *Ceratozamia*. It was during periods of researching the literature, and observing both herbarium and horticultural specimens that one species of *Ceratozamia* really stood out as unique in so many ways. The more I learned the more I began to realize that the idea of

revising the genus was far from my capabilities. Nevertheless, the exposure to all of the information I had accumulated certainly suggested that there were species known in horticulture but unknown to science. Yes, undescribed species of *Ceratozamia*! Admittedly, the 1970's were ideal to cultivate an interest in American cycads - collected mature plants were readily available from many sources. At times these plants were so abundant in the trade that one could expect to find various Mexican genera and species at almost any nursery along the gulf coast. Few people of that period seem to give much thought to the idea of conservation of wild populations and to the constant flow of collected plants across the borders.

One species quickly became my favorite, *Ceratozamia* "Hilda", perhaps because it was so unique among ceratozamia and because it was unknown to science while well known in horticulture. When I first proposed describing a species from horticultural material to Dr. Harman and those at FTG it was very well received. Crafton Cliff, the FTG horticulturist at that time, who was surprised to learn of my intentions, applauded the idea. I was encouraged by many to do so.

If I was to describe a new species from horticulture, I had to be absolutely convinced that it was unknown and had not been previously described under some obscure name. A complete review of the known species of *Ceratozamia* and their botanical descriptions was first on the list of things to do. Fortunately, *Ceratozamia* "Hilda," with its clustered leaflets, was so unique among all cycads that the literature would surely reveal if it had been previously described. After a year or more of literature research, I was convinced that it was not. Others around me were convinced long before I was. Now the task at hand was to actually describe it. For help, I turned to Marcia Wilson, who intimately knew the person responsible for the first introduction of this cycad into cultivation and the reason behind the peculiar but so familiar name of "Hilda." Marcia supplied me with information about its location in Mexico and the history of its discovery. I elicited the help of renowned mycologist and Latin scholar Dr. Bernard Lowy of LSU, whose help in the Latin description of the plant was invaluable. Dr. Walter Harman offered specimens from one of his cultivated plants for designation as the type material. A botany student and friend at LSU, Scott W. McReynolds, offered to do the drawing of "Hilda" to

be used in the publication. Then came the time to choose a name for this new species. For the first time ever I will reveal that my initial preference for a name was not *Ceratozamia hildae*. I really wanted to be more innovative - my first preference was *Ceratozamia "bambusifolia."* I liked that name, and after all, *Ceratozamia* "Hilda" was also referred to in the trade as the Bamboo Cycad. But I was out to solve a nomenclatural problem and not create a new one. Ultimately I realized that the only people who actually knew and cared about this unique cycad, the collectors and growers, knew it as "Hilda." To introduce a new name to an already widely known plant, I thought, would have only complicated the matter. The horticultural trade was filled with common names, names handed down from importer to distributor and distributor to collector, and by the time it reached the collector, any significance behind the name was almost certainly lost. I recall a perfect example, *Ceratozamia* "Thomas and Charlie." It was not until I had traveled into Mexico several times that I realized the name was the corrupted name of the small town Tamazunchale, a favorite spot in Mexico for bird watchers and plant collectors. Yet most people only knew the plant as C. "Thomas and Charlie." So in the end, I decided to simply latinize the name "Hilda" to *hildae*, thereby retaining the original identity of this amazing plant. The description was submitted to Brittonia for publication and subsequently accepted. *Ceratozamia hildae* was now a valid species.



Unidentified *Ceratozamia* sp. with receptive magastrobilus.

Notes on *Ceratozamia hildae*

By Jeff Chemnick

Ceratozamia hildae has long been one of the most enigmatic neotropical species for several reasons. Though widely represented in collections throughout the world due to extensive collecting in the seventies and subsequent propagation, the wild population was thought to be extinct because no one apparently had seen the plant in situ for a couple of decades. Though various botanists as well as cycad fanciers had gone in search of *C. hildae* over the years, it seemed to have vanished from its purported type locality and was largely regarded as extirpated due to over-collecting and habitat destruction. Another paradox existed around the ease with which this species can be propagated in southern Florida. Long thought to be a high elevation species, it seemed to contradict the cultivation experiences of other montane *Ceratozamia* species, which do not readily cone and lend themselves to easy propagation in lowland tropical climates. Furthermore, though the fasciculate leaflet arrangement (whorls or clusters bunched together) on the rachis is more typical, nonfascicled plants are known in many collections. This has led some to conclude that perhaps the fascicled *C. hildae* were aberrations of some kind and had been selected out of a population that contained many more of the non-fascicled types giving a false impression of the more typical morphology.

When the Montgomery Botanical Center of Miami, Florida joined forces with GannaWalskaLotusland of Santa Barbara, California and the Institute of Ecology in Xalapa, Veracruz (and future site of the 2005 International Cycad Conference) several years ago to sample as many wild

Ceratozamia populations in Mexico as possible, one of the many goals was to rediscover the type locality of *C. hildae*.

The original description by G.P. Landry & M.C. Wilson, *Brittonia* 31: 422 (1979) has an unfortunate typographical error which claims an elevation of 3600 km (approx. 2200 miles)! Perhaps one result was to give the cycad world the impression that *C. hildae* was a montane species. Several of the cycad enthusiasts I know that have gone in search of *C. hildae* have looked long and hard in areas of high elevation. Our working hypothesis was that the error was in units and that instead of “km” the authors meant “ft.” Certainly 3600 feet would be the correct elevation for a number of *Ceratozamia* species and seemed a good place for us to begin our search. The day we arrived to begin our search, we indeed found several dirt roads that our topographic maps indicated would transect upward through such elevations and perhaps through habitat that still was sufficiently intact that it might contain some remaining wild plants. But unfortunately (or fortunately as we later found out), the recent rains had turned our roads into a muddy mess which our vehicle could not traverse. After several attempts to gain elevation only to slip and slide and nearly tumble off the road completely, we were forced to retreat to the lower elevations whence we came. It was hot and humid and we were rather frustrated to add our names to the list of those who had come in a fruitless attempt to find a wild *C. hildae* population. But as we were slowly heading back, we came across a local fellow standing in front of his house. Mostly out of habit and perhaps some desperation, I showed him a leaf that we had recently collected of *C. microstrobila* (which is the most similar in general appearance to

C. hildae). “Si, hay!” He responded (Yes, it is here!), telling me that he had such a plant in his backyard but that the leaves were longer and the leaflets were in clusters rather than uniformly arranged like my sample. This was sufficient information to get everyone very excited. I followed him into his house where he explained the situation to his wife who eyed us with a bit of uncertainty. Fortunately she consented to our passage to the backyard to see the garden. At first I couldn’t see any cycad at all because the leaves on his plant were so tall that they eluded my search image. Then....there it was! A plant of *C. hildae* with 3m leaves! His response to my question about where his plant came from was to strap on his machete, tell his wife he would be right back, and exclaim “Vamonos!” Buzzing now with anticipation, our group quickly loaded up water, cameras, field equipment and rubber boots for the hike. Though our guide was in his seventies, he outpaced us all as he effortlessly moved over the extremely slippery karst substrate en route to the population. Only a 20 minute walk from his house, we finally came face to face with some wild plants. After an hour or so of canvassing the area, we found upwards of 50 specimens, including several non-fascicled individuals which, curiously, seems to match the approximate ratio of wild collected plants seen in cultivation. The elevation? 360 meters. No wonder this supposed “high elevation” plant did so well in Florida! No wonder it was thought to be extinct. Wet and muddy but very pleased to have documented at long last that *C. hildae* is very much alive and well in the wild.

With respect to cultivation in Santa Barbara, I can attest that it will grow outdoors year round but doesn’t begin to produce leaves of the length we saw in Mexico. Rather, leaves of 1m+ are typical. When grown in full sun, the leaflets will often produce a waxy, glaucous bloom that gives the plants an almost bluish appearance from a distance. Plants growing in Santa Barbara typically produce two to four leaves and look best when grown in clusters. I know of a pair of plants growing side by side in a nearby garden that happen to be male and female. The plants seem to cone every other year and though the owner never pollinates the female cone, it has produced upwards of a dozen viable seed on several occasions.

Because *C. hildae* is distinctive, leaf friendly, and easily grown, it makes a wonderful addition to any cycad garden whether in the highlands, lowlands, tropics or California.



Male plant of *C. hildae* with *microstrobili*. Photo by Bijan Dehgan.