Palms of Northeastern Mexico

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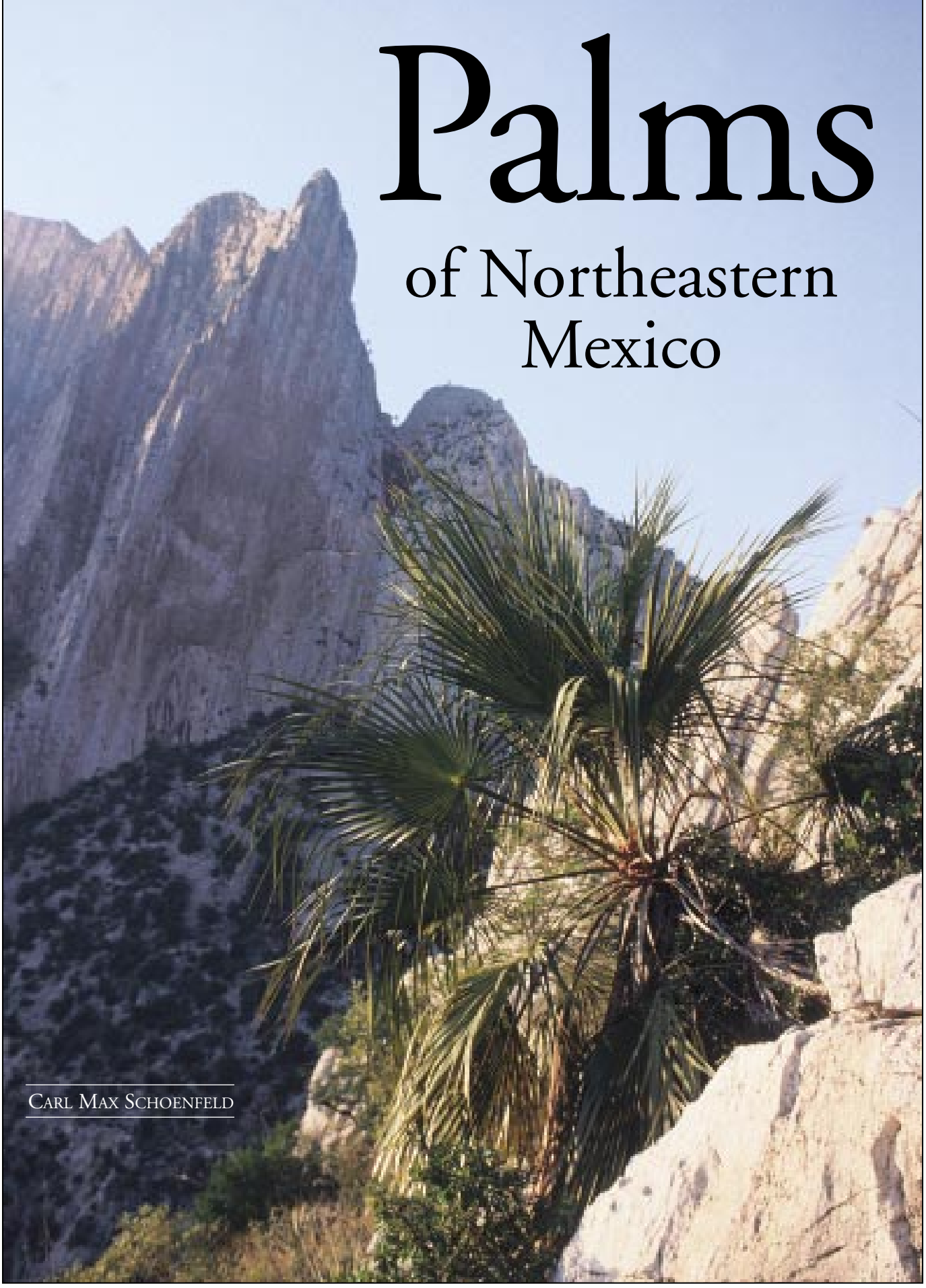

Photo by Carl Max Schoenfeld

The type location for Brahea berlandieri.

ABSTRACT

Nine species of palms native to northeastern Mexico are successfully grown at Yucca Do Nursery. These palms are easy to propagate, surprisingly cold hardy, and occupy biologically and geologically intriguing sites. Brief descriptions of each species and general propagation techniques are provided.

KEY WORDS: *Brahea, Chamaedorea, Sabal*, Arecaceae, seed propagation, cold hardiness

NOMENCLATURE: MOBOT (2002)

Mexico ranks third in the world in biological diversity (Mittermeier 1988) despite the fact it is only the fourteenth largest country in the world, having a land area about one-fourth that of the US. Mexico boasts about 30,000 species of plants with well over 21,000 species of flowering plants. Its contribution cannot be equaled when food crops are added to the equation, since Mexico is the only country where mega biodiversity and a center of agriculture coincide (Ramamoorthy and others 1993). Now that you have an idea of the vastness of the Mexican flora, I would like to narrow the scope considerably and discuss the palms (Arecaceae) of northeastern Mexico.

Many different palms can be found in the dramatic mountains of northeastern Mexico. The awe-inspiring landscapes of these mountains entice the senses of the plant explorer and captivate the mind with hidden valleys and ever higher peaks. The Sierra Madre Oriental starts its sinuous edge in southern Mexico, and flows north paralleling the Gulf of Mexico, ending about 160 km (100 miles) short of southwest Texas. Here it breaks up into a series of isolated mountains surrounded by deserts; some individual peaks reach heights of 2438+ m (8000+ ft). This region of Mexico is home to many handsome palms, most of which remain virtually unknown outside of a few collections despite being within a day's drive of Texas. Oddly, these represent some of the most cold-hardy palms that can be grown in temperate climates. This geologically divided region has its eastern foot in the hot and humid subtropical lowlands while to the west lie the cool and dry highlands. This topographic formation is the perfect recipe for site-specific endemic species to thrive and survive from ancient times to the present.

Politically, northeastern Mexico is delineated by the states of Coahuila, Nuevo Leon, Tamaulipas, San Luis Potosi, and Hidalgo. In these states the following genera of palms can be found: *Brahea* Mart. ex Endl., *Chamaedorea* Willd., and *Sabal* Adanson ex Guersent. Continuing to narrow the scope, these 3 genera will be the focus of further discussion.

To me, the excitement an beauty of Mexico is unmatched. And yet, despite its close proximity to the US, it has been overlooked as a source of new plant material. The palms are just an example of this neglect. In over 100 visits to Mexico, each trip has resulted in some new discovery.

Photo by Carl Max Schoenfield

Figure 1 • Brahea bella.

BRAHEA COMPLEX

"What species is this?" This is a common problem when trying to identify new and unfamiliar plants. It is particularly difficult when several very similar species were named before sampling the entire population. This is the case with the trunk-forming braheas. This complex includes the following species: *Brahea dulcis* (Kunth) Mart., *B. berlandieri* Bartlett, and *B. bella* L.H. Bailey (Figure 1). Time will tell whether they remain separate species or become lumped into 1 diverse species. In Mexico, taxonomy is a ship that sails in uncharted waters, and I was privileged to lead an expedition into Mexico with Donald Hodel, author of *Chamaedorea Palms, The Species and their Cultivation* (Hodel 1992). Our objective was to collect herbarium specimens specifically on the palms of northern Mexico in order to gain an understanding of the characteristics that delineate a species. This work is in progress and will take some time to complete.

The range of the *Brahea* complex mirrors that of the Sierra Madre Oriental. Rock palm, as species of this complex are commonly called, can be seen growing out of a sheer rock face only a 1-h drive south of the Texas border. They can be found clinging to exposed limestone faces of these mountains all the way south into Guatemala. What makes this complex so distinctive is the incredible breadth of climates that it inhabits while always growing in limestone. Imagine a 610 m (2000 ft) cliff with jagged edges pockmarked with rock palms growing parallel to the cliff surface—unbelievable! These upright trees, with smooth dark gray bark and bright green fan-shaped leaves, share the breeze with parrots playing in warm updrafts and captivate the imagination. Rock palms are about the same size as the Chinese windmill palm (*Trachycarpus fortunei* (W. J. Hooker) H. Wendl. [Arecaceae]) and would be used in the same applications. However, braheas are more tolerant of drying wind and

Photo by Carl Max Schoenfeld

Figure 2 • *The stout blue leaves of* Brahea decumbens *make it a desirable ornamental.*

drought. Since they are native to limestone, they are perfect for areas with shallow soils over limestone that would stunt or kill *T. fortunei*.

BRAHEA MOOREI

Whereas the *Brahea* complex extends over a huge area and grows on exposed rock, *Brahea moorei* L.H. Bailey is localized and mesic. This species is unique and cannot be confused with any other. *Brahea moorei*, although never plentiful, is found in northern Tamaulipas in the cool shade of large *Quercus rysophylla* Weatherby (Fagaceae) and *Quercus polymorpha* Cham. & Schlecht. on the eastern flank of the Sierra Madre Oriental mountain range. This site is particularly rich in temperate flora such as *Styrax platanifolius* Engelm. ex Torr. ssp. *mollis* P. Fritsch (Styracaceae), *Hamaemealis mexicana* Standl. (Hamamelidaceae), *Persea podadenia* S.F. Blake (Lauraceae), *Mahonia gracilis* (Benth.) Fedde. (Berberidaceae), *Magnolia tamaulipana* A. Vazquez (Magnoliaceae), and *Liquidambar styraciflua* L. (Altingiaceae or Hamamelidaceae), to name a few. The area is bathed in periodic fogs before late June when the summer rains settle in. The backdrop is dramatic—towering cliffs of solid limestone that cut the hot sun by noon. *Brahea moorei* is a small delicate palm that has a creeping habit and never forms a vertical shaft. Upon maturity, it produces a chalky white wax that is most pronounced on the underside of the leaf. The new leaf bud is also covered in this white wax and as the leaf expands a highlight of it remains on the top of each leaf ridge. The overall effect is stunning. Imagine a delicate apple-green dwarf fan palm dusted with frost and the bottoms of the leaves flocked white—beautiful beyond words. (Plants at Peckerwood Garden, Hempstead, Texas, are now exhibiting this characteristic after 10 y.) In the wild, goats often eat the flower shaft, thus limiting its ability to produce seeds. Flower stalks are 3X the length of leaf petioles. When seen in fruit, this is a striking palm with long arching stalks topped with clusters of yellow fruit. Due to either drought or goats we have had lapses of up to 4 y before catching this palm in fruit. But now, after 10 y in the garden, they have flowered for the first time. We hope that they will set viable seeds in cultivation.

BRAHEA DECUMBENS

This xerophytic species is native to the dry rain shadow areas of the Sierra Madre Oriental. Its habitat is the opposite of *B. moorei*. *Brahea decumbens* Rzedowski grows on exposed limestone in a lunar-like landscape of rugged rock and rough terrain. This highly ornamental species has unique stout blue leaves (Figure 2). The 60-cm-long (2-ft) fan-shaped leaves are upright and held so close together that you cannot see their base. Very old specimens resemble an abandoned wagon wheel as the creeping trunk runs along the ground forking as it goes and, after a very long time, encircling the spot where the plant originated. These "wagon wheels" dot the landscape and help build the lean, stony soil and prevent drying winds from blowing soil away. The plant community that this plant inhabits is distinct, primarily made up of woody lilies (a term coined to describe woody members of the classic lily family [Liliaceae] native to the New World). These architectural plants create an unreal landscape in which several species of *Dasylirion* Zucc. (Nolinaceae) predominate. As the plant ages, the leaves of *B. decumbens* turn a ghostly blue that varies with each individual but always contrasts with the dark green leaves of seedlings surrounding mature plants. From seeds, mature blue foliage may take up to 15 y to form. When rains are good these palms produce short, stout flower stalks and set seeds. The broad panicle is held within the leaves, which makes it difficult to see but easy to distinguish from the thin long panicle of *B. moorei*.

CHAMAEDOREA MICROSPADIX

Every year *C. microspadix* Burret leaves are collected by the burrow-load for sale in markets all across Latin America. They are used for decoration on religious holidays—especially Easter. Of the approximate 100 species of *Chamaedorea* found in the New World, 2 species are native to northeastern Mexico and they are also the 2 most cold-hardy species one can grow in temperate climates. In the wild, these palms grow on steep slopes in the primeval forest facing the Gulf of Mexico in the states of Tamaulipas, San Luis Potosi, and Hidalgo at elevations of 610 to 1525 m (2000 to 5000 ft). This area is home to the Huesteca, a people that descended from the Mayas, who live in an area that has changed very little cli-

matically. Thus it is a refugium for plants. In the past, this part of Mexico was a giant causeway over the millenniums—a place where flora and fauna of both the Northern and Southern Hemispheres met. *Chamaedorea microspadix* grows on steep, moist, rock faces. Here you can catch glimpses of its bamboo-like clumps and clusters of bright red berries in the fading light of winter. This palm has a definite tropical feel about it. The large, fishtail-like leaves flutter as moist gulf air condenses into fog on the peaks above. This trouble-free palm is, surprisingly, quite cold hardy, surviving temperatures into the low teens (–10 °C) without foliage damage. In the record freeze of 1990 (record lows of –16 to –13 °C [3 to 8 °F]) they sprouted from the ground. If you do not get enough cold to freeze them back every 10 y, you will probably need to trim them back so they do not get too tall and leggy.

CHAMAEDOREA RADICALIS

Chamaedorea radicalis Mart. is an elusive jewel of temperate woodlands. A hardy feather palm with elegant, arching, finely divided black-green leaves, it mimics the cycads (*Ceratozamia* spp. Brongn. [Zamiaceae]) of the area. *Chamaedorea radicalis* is found in the deep shade of large evergreen oaks, peeking out and around large boulders—the perfect setting to display luminous bright red fruits. Unlike *C. microspadix* that forms a bamboo-like clump, this species has a single trunk rarely exceeding 15 cm (6 in). This palm is never found in great abundance—just a scattering here and there where its special requirements can be met: ample moisture, perfect drainage, deep shade, and a rocky substrate. Although site specific in habitat, it is easily accommodated in cultivation as long as it is given shade. It is valuable because it adds a striking foliage texture and showy fruits to shady beds.

SABAL MEXICANA

While traveling in Tamaulipas, Mexico in the late 1980s we noticed an isolated colony of *Sabal mexicana* Mart. growing in a canyon guarded by large 12-m-tall (40-ft) trees that line the visitor's view of this beautiful valley. Curiously we noticed that this sabal population looked different from the typical sabals seen in the coastal plains. Here, they grew in such great profusion that you could not see the ground. Palms of all sizes are seen simultaneously competing for space, but here, at higher altitude, the sabals stood out like solemn totem poles (Figure 3) with only the occasional youngster waiting its turn in the shade of Mexican oaks—mostly *Quercus canbyi* Trel. and *Q. rysophylla*. The environment is also different; instead of the deciduous legume forest composed of *Acacia* Mill. (Fabaceae) thorn scrub we found large evergreen oaks. The stream that divides the valley is surrounded by a rich and diverse understory of shrubs and herbs. What has made these palms look different from one another is subtle and circumstantial. They are the same but they respond differently because of their environments. Fire plays a huge part in the predominance of *S. mexicana* in the hot dry plains and has no influence in the moist upland valleys. Their rate of growth and reproduction is evidence of these factors. Proceeding up the valley, we came upon another clear running stream but this time it cut through solid rock folds, the foothills of the larger mountains to our west, and a rich forest. I have been to this location many times but until October 2001 never noticed that one of these mighty *S. mexicana* was variegated creamy yellow. What a find! Time spent under this tree revealed that it would be possible to collect seeds of which a certain percentage would also be variegated—a fact born out by the numerous variegated seedlings sprouting at its base. No matter how many times I return to Mexico there is always something new to discover.

SABAL SP. TAMAULIPAS

A discovery is made!

The limestone ridges and cliffs were covered with *Brahea* while in the dense forest below stood huge oaks and pines towering to 24+ m (80+ ft). Here at its most northern location, *Chamaedorea radicalis* makes a stunning sight. This area is higher in altitude (914 m [3000 ft]) and higher in rainfall than the *Sabal mexicana* area. While driving

TABLE 1

Characteristics of 10-y-old palms growing at Peckerwood Garden, Hempstead, Texas (USDA hardiness zone 8b)

			Leaves			
Species	Height (m)[a]	Width (m)	Width (m)	Length (m)	Carried (number)	Trunk
Brahea complex	3.5	3.9	1.5	1.5	28	1.2 m, upright
Brahea moorei	1.5	2.1	1.1	0.8	20	33 cm, creeping
Brahea decumbens	1.5	1.8	0.7	0.6	15	20 cm, creeping
Chamaedorea microspadix	2.4	4.6	0.4	0.8	4	1.8 m, upright
Chamaedorea radicalis	0.3	1.5	0.5	0.7	5	17 cm, upright
Sabal mexicana	3.6	4.6	1.5	1.5	18	1.2 m, upright
Sabal sp. Tamaulipas	2.7	6.6	2.1	1.8	12	No above ground trunk

[a] Conversion: 1 m = 3.3 ft.

TABLE 2

Characteristics of germination, first true leaves, and frost protection at Peckerwood Garden, Hempstead, Texas (USDA hardiness zone 8b)

Species	Germination [a]	First true leaves		Frost protection				
		Time from germination to formation (y)	Size (cm) [b]	Frost cloth	One pot	Two pots	Minimum temperature exposed [c]	USDA hardiness zone
				°C (°F)				
Brahea complex	moderate, 1 y	2 to 4		–3 (26)	6.5 (20)	–9 (15)	–15 (5)	8a
Brahea moorei	high, < 1 y	3 to 4	15 to 23 wide	–3 (26)	–6.5 (20)	–9 (15)	–9 (15)	8a
Brahea decumbens	low, 2+ y	4 to 5	15 to 23 wide	2 (36)	–6.5 (20)	–9 (15)	–9 (15)	8a
Chamaedorea microspadix	high, < 1 y	1 to 2	13 to 18 long	–4 (25)	–9 (15)	–12 (10)	–9 (15)	8b
Chamaedorea radicalis	high, < 1 y	1 to 2	10 to 15 long	–4 (25)	–9 (15)	–12 (10)	–9 (15)	8b
Sabal mexicana	high, <1 y	4 to 5	5 to 8 long	–4 (25)	–9 (15)	–12 (10)	–9 (15)	7b
Sabal sp. Tamaulipas	high, < 1 y	3 to 4		–4 (25)	–9 (15)	–12 (10)	–9 (15)	7

[a] Estimate of viability and time for seeds to begin germinating.

[b] Conversion: 1 cm = 0.4 in.

[c] Lowest temperature to which established plants have been exposed without mortality.

through this lush temperate forest we found ancient specimens of *Sabal mexicana* towering into the tree canopy, but every size of *Sabal mexicana* imaginable was present. The leaves on some of the young plants were gigantic. Some had short trunks, and others had no trunks but were identifiable because of the size of the leaves and length of their petiole. After carefully looking over the young plants, we spotted shorter petioled, trunkless sabals scattered about. As the road cut through the forest a few of these trunk-less sabals were exposed revealing an interesting feature—this *Sabal* ran horizontally on the ground while similar sized *S. mexicana* plunged their tap roots deep in the ground where the trunk starts its upward march. In another area farther up the road we found one of the trunkless sabals running off of a limestone cliff. It is apparent that this trunkless *Sabal* runs on the ground while its kin stays put and forms a permanent root run. Very old trunkless sabals were found that could be traced back 2.4 m (8 ft) to where the plant originated. These old trunks wear away with time while new roots form at the crown's base. At first, we thought that these trunkless sabals were seedlings of *S. mexicana* until years later we found these same trunkless sabals in seed. The narrow flower spike that held the large seeds extended up and beyond the broad blue-green leaves. The seeds were very large and flat like an M&M's candy but colored a rich mahogany. We went back to inspect the large *S. mexicana* for seeds and found that their old flowering branches were a many-branched panicle held within the foliage. Their old flowering branch actually hung below the leaf base, quite different from our trunkless sabals. Could these be a different species or are they juvenile *S. mexicana* flowering prematurely?

The trunkless sabal was numerous in this area and no trunk forming specimens could be found. We gathered seeds from this trunkless *Sabal* and planted them—they germinated quickly! We offered them in our catalogue in fall of 1990. We had previously grown *S. minor* (Jacq.) Persoon that is considerably slower to grow and mature than our trunkless *Sabal*. Affectionately we would refer to our Mexican trunkless *Sabal* as "Mexican minor." Reports started coming in that it was proving very adaptable with customers up to zone 7 praising its cold hardiness with no damage occurring at temperatures near –18 °C (0 °F). European customers reported their success as well! One thing is assured: our "Mexican minor" is here to stay because our original plants are now 2.1 m (7 ft) tall and producing viable seeds. These seeds were planted and were offered in our 2002 catalog. The cycle has gone full course in 15 y but the identity is still a mystery!

SEEDS, GERMINATION, AND CARE

After 10 y, all species are growing robustly at Peckerwood Garden (Table 1) and several species are producing viable seeds: *Chamaedorea microspadix*, *C. radicalis*, *Sabal mexicana*, and *Sabal* sp. Tamaulipas. Both *Chamaedorea* species are prolific seed producers. I prefer to harvest, clean, and plant seeds promptly. I clean seeds by placing individual fruits inside a plastic bag, adding enough water to moisten the seeds, and sealing the bag to allow the pulp to ferment. After 1 wk, I pour off the excess water and fermented pulp, add fresh water and allow the

fermentation process to go again. I repeat the process as often as necessary until the seeds are clean. I place clean seeds on newspaper to dry. Clean seeds can be stored dry for several months without harming germination.

I sow seeds of all species into individual pots that are narrow and deep, since the palms resent being divided from community pots. Germination varies by species (Table 2). My medium is well-drained and coarse, and I plant seeds twice their diameter beneath the mix. Soil should be kept moist during the warm months but less so during winter. At Yucca Do Nursery, we use open-end band pots that are 7.3 cm (2.9 in) wide by 23 cm (9 in) deep and made by Anderson Die and Manufacturing Co, Portland, Oregon. *Chamaedorea* spp. can be started in smaller pots.

From my experience, the most successful time to transplant into the landscape or into larger pots is during mid spring when nighttime temperatures are warm and the palms are in active growth. My success is better when I keep as much soil around the root-ball as possible, spray both sides of leaves with anti-transpirant, and tie the leaves together around the central bud. I keep potted transplants in a humid area, under shade, and protected from strong wind until they become established.

At Yucca Do, we always protect our newly-transplanted palms the first few winters until they are acclimated. I add more frost protection incrementally as the temperature decreases, starting with a frost cloth. If the temperature continues to decrease, I place a plastic pot over the plant, and if the temperature continues to decrease, I add another pot. Critical temperatures for adding frost protection devices are in Table 2. Once acclimated, plants will tolerate very cold temperatures (Table 2). For example, gallon-sized plants of *Brahea decumbens* in Hempstead, Texas, will freeze dead at 0 °C (32 °F) while plants that have been established for 5 y suffer no effects at –9 °C (15 °F).

Because of their small stature, 4 species make excellent potted plants: *Brahea moorei*, *B. decumbens*, *Chamaedorea microspadix*, and *C. radicalis*. In addition, both *Chamaedorea* species require shade, which enhances their usefulness for potted culture.

Photo by Carl Max Schoenfeld

Figure 3 • *A single* Sabal mexicana *growing at a high elevation site near Tamaulipas, Mexico.*

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