

# Growth Rates of Palms in Fairchild Tropical Garden

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One of questions we are most frequently asked concerning palms is, "How fast do they grow?" Reference books may give relative terms, such as "slow" or "moderately fast," but actual growth rates are seldom reported. Spurred by questions from fellow palm enthusiasts, we present the following growth rate data gathered from seed-grown palms in Fairchild Tropical Garden, Miami, Florida, USA.

The palms included in our sample were chosen at random, according to accessibility and availability of records. We measured the height of single-stemmed palms from the ground (or the top of the root mass) to the bottom of the sheathing leaf base (where the lowest live leaf attaches to the stem). In other words, neither the crownshaft nor crown was included in height measurements; only the trunk was measured. For certain palms in which the bottom of the leaf base was obscured by dead leaf base fibers (certain *Coccothrinax*, for example), we visually estimated the position of the base of the lowest live leaf and measured from there. We used a measuring rod graduated in centimeters (Hastings Tools & Equipment, Hastings, Michigan) that telescoped to 750 cm, supplemented with a measuring tape, as needed. Age was determined from the year in which the seeds were received by Fairchild Tropical Garden. Stem height was divided by the age of the palm to give the growth rate, expressed in cm/yr and rounded to the nearest centimeter.

In interpreting the growth rates given here (Tab. 1), certain caveats apply. First, these rates are lifetime average growth rates. They do not take into account the variation in growth rate over the

life of a palm, which may grow quickly as a juvenile but slowly as a reproductive adult. These rates do not take into account the pre-germination period, which may be many months in certain *Coccoloba*, nor do they account for the establishment phase, during which a seedling palm may form no above-ground stem. Second, these rates are taken from individual palms growing in Miami whose growth rates may not be typical. Palms grown elsewhere may have significantly different growth rates (slower or faster).

Our results (Tab. 1) indicate, not surprisingly, that considerable variation exists in average growth rates. In instances where we measured several individuals from the same seed lot (individuals sharing the same accession numbers but with different letter suffixes – *Calyptrocalyx rivalis* and *Ravenea rivularis*, for example), growth rates may vary two-fold or more. The four fastest-growing palms in our sample are *Livistona robinsoniana*, *Carpentaria acuminata*, *Bentinckia nicobarica* and a young *Ptychosperma salomonense*. The slowest palms in our sample are two Bahamian accessions of *Pseudophoenix sargentii* ssp. *saonae* var. *saonae* and an individual of *Ravenea hildebrandtii*. The

difference in rates between the slowest and fastest palms is greater than twenty-fold.

Growth rates are governed by the interplay of genetic factors and external factors, such as availability of light, water, nutrients, etc.; however, we are unable to determine which of these factors is the most important in explaining the tremendous variation in our data. Nevertheless, we hope these data will give growers of palms some

idea of the growth rates that can be expected for these species and that the data will be useful in making informed planting decisions.

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**Table 1. Average growth rates of palms growing in Fairchild Tropical Garden. The growth rate can be converted into inches per year by dividing the figure by 2.54.**

Taxon	Accession Number	Height (cm)	Age (yr)	Rate (cm/yr)
<i>Aiphanes minima</i>	70304A	669	30	22
<i>Areca catechu</i>	8334C	558	17	33
<i>Areca catechu</i> var. <i>longicarpa</i>	87299B	276	13	21
<i>Astrocaryum mexicanum</i>	5930A	213	41	5
<i>Bentinckia nicobarica</i>	88107B	536	12	45
<i>Bentinckia nicobarica</i>	83150C	809	17	48
<i>Bismarckia nobilis</i>	73201A	357	27	13
<i>Bismarckia nobilis</i>	68263A	378	32	12
<i>Borassodendron machadonis</i>	581026A	339	42	8
<i>Borassus aethiopum</i>	58152C	744	42	18
<i>Borassus aethiopum</i>	58152D	656	42	16
<i>Brahea armata</i>	70127B	580	30	19
<i>Brahea brandegeei</i>	59679	700	41	17
<i>Brassiophoenix drymophloeoides</i>	68251A	376	32	12
<i>Calyptronoma rivalis</i>	81292A	275	19	14
<i>Calyptronoma rivalis</i>	81292B	141	19	7
<i>Carpentaria acuminata</i>	89213A	567	11	51
<i>Caryota cumingii</i>	77961C	505	23	22
<i>Clinostigma samoense</i>	79218G	461	21	22
<i>Clinostigma samoense</i>	79218J	515	21	25
<i>Coccothrinax argentata</i>	88411A	142	12	12
<i>Coccothrinax argentea</i>	4648B	948	54	18
<i>Coccothrinax argentea</i>	84255B	577	16	36
<i>Coccothrinax barbadensis</i>	59740D	431	41	11
<i>Coccothrinax inaguensis</i>	58650A	281	42	7
<i>Coccothrinax litoralis</i>	58534A	340	42	8
<i>Coccothrinax miraguama</i> ssp. <i>roseocarpa</i>	60798H	504	40	13
<i>Coccothrinax proctorii</i>	59627A	528	41	13
<i>Coccothrinax proctorii</i>	80724B	261	20	13
<i>Coccothrinax proctorii</i>	6220A	159	38	4
<i>Coccothrinax proctorii</i>	6220D	174	38	5
<i>Coccothrinax scoparia</i>	58839B	561	42	13
<i>Coccothrinax spissa</i>	58477A	444	42	11
<i>Copernicia alba</i>	6458B	716	36	20
<i>Copernicia baileyana</i>	6235A	568	38	15
<i>Copernicia curtissii</i>	6912A	265	31	9
<i>Copernicia hospita</i>	60532F	229	40	6
<i>Copernicia hospita</i>	60532H	209	40	5
<i>Copernicia macroglossa</i>	71443E	434	29	15
<i>Copernicia prunifera</i>	60810A	401	40	10

<i>Copernicia rigida</i>	57725E	215	43	5
<i>Copernicia yarey</i>	59971A	247	41	6
<i>Copernicia yarey</i>	59971D	241	41	6
<i>Cryosophila stauracantha</i>	8089A	434	20	22
<i>Cryosophila stauracantha</i>	8089B	349	20	17
<i>Cyphophoenix nucele</i>	74344C	253	26	10
<i>Cyrtostachys loriae</i>	81225C	312	19	16
<i>Dictyosperma album</i> var. <i>album</i>	88207B	289	12	24
<i>Dictyosperma album</i> var. <i>aureum</i>	88373A	255	12	21
<i>Drymophloeus litigiosus</i>	73314B	268	26	11
<i>Drymophloeus oliviformis</i>	75453A	216	25	9
<i>Drymophloeus pachycladus</i>	65982D	630	35	18
<i>Drymophloeus subdistichus</i>	75396A	582	25	23
<i>Drymophloeus subdistichus</i>	75396B	813	25	33
<i>Dypsis decaryi</i>	80528B	218	20	11
<i>Gastrococos crispa</i>	661023A	688	34	20
<i>Gastrococos crispa</i>	661023B	693	34	20
<i>Gaussia attenuata</i>	7184E	780	29	27
<i>Gaussia attenuata</i>	79558E	539	21	26
<i>Gaussia princeps</i>	58797F	644	42	15
<i>Gulubia costata</i>	80106A	322	20	16
<i>Gulubia macrospadix</i>	87504A	488	13	38
<i>Heterospathe salomonensis</i>	73480D	318	27	12
<i>Hyophorbe lagenicaulis</i>	581174B	269	42	6
<i>Hyophorbe lagenicaulis</i>	581174C	228	42	5
<i>Hyophorbe lagenicaulis</i>	58687E	280	42	7
<i>Hyophorbe verschaffeltii</i>	72781A	322	28	12
<i>Hyphaene thebaica</i>	58837H	712	42	17
<i>Kentiopsis oliviformis</i>	77146C	409	23	18
<i>Latania loddigesii</i>	75460A	284	25	11
<i>Latania loddigesii</i>	72519A	358	28	13
<i>Licuala grandis</i>	6145B	206	39	5
<i>Livistona bentharii</i>	84294C	339	16	21
<i>Livistona decipiens</i>	82383A	399	18	22
<i>Livistona decipiens</i>	82383B	339	18	15
<i>Livistona decipiens</i>	62207G	795	38	21
<i>Livistona inermis</i>	84233A	215	16	13
<i>Livistona mariae</i>	57787C	873	43	20
<i>Livistona mariae</i>	57787D	795	43	18
<i>Livistona merrillii</i>	80659B	577	20	29
<i>Livistona nitida</i>	84376A	259	16	16
<i>Livistona robinsoniana</i>	8310A	925	17	54
<i>Livistona woodfordii</i>	591028A	545	41	13
<i>Livistona woodfordii</i>	591028B	741	41	18
<i>Normanbya normanbyi</i>	66656B	460	34	14
<i>Normanbya normanbyi</i>	74472C	512	26	20
<i>Orania palindan</i>	85370A	190	15	13
<i>Pseudophoenix lediniana</i>	74393A	287	26	11
<i>Pseudophoenix lediniana</i>	63198A	674	37	18
<i>Pseudophoenix sargentii</i> ssp. <i>saonae</i> var. <i>navassana</i>	60171D	697	40	17
<i>Pseudophoenix sargentii</i> ssp. <i>saonae</i> var. <i>navassana</i>	60171S	215	40	5
<i>Pseudophoenix sargentii</i> ssp. <i>saonae</i> var. <i>navassana</i>	60171U	273	40	7
<i>Pseudophoenix sargentii</i> ssp. <i>saonae</i> var. <i>saonae</i>	5880A	103	42	2

<i>Pseudophoenix sargentii</i> ssp. <i>saonae</i> var. <i>saonae</i>	5880B	100	42	2
<i>Pseudophoenix sargentii</i> ssp. <i>saonae</i> var. <i>saonae</i>	60183A	248	40	6
<i>Pseudophoenix sargentii</i> ssp. <i>sargentii</i>	58872	291	42	7
<i>Pseudophoenix sargentii</i> ssp. <i>sargentii</i>	591181G	113	41	3
<i>Pseudophoenix sargentii</i> ssp. <i>sargentii</i>	82441A	159	18	9
<i>Pseudophoenix vinifera</i>	81401A	209	19	11
<i>Ptychococcus ledermannianus</i>	75171C	405	25	16
<i>Ptychosperma caryotoides</i>	74263D	346	26	13
<i>Ptychosperma pullenii</i>	81590K	213	19	11
<i>Ptychosperma salomonense</i>	85181A	459	15	31
<i>Ptychosperma salomonense</i>	951038A	227	5	45
<i>Raphia farinifera</i>	66748A	284	34	8
<i>Ravenea rivularis</i>	76985C	510	24	21
<i>Ravenea rivularis</i>	76985D	250	24	10
<i>Ravenea hildebrandtii</i>	61378N	162	39	4
<i>Ravenea hildebrandtii</i>	61378P	91	39	2
<i>Roystonea princeps</i>	66674B	690	34	20
<i>Roystonea princeps</i>	66674D	878	34	26
<i>Roystonea princeps</i>	64563C	722	36	20
<i>Sabal domingensis</i>	67269C	369	33	11
<i>Sabal mauritiiiformis</i>	6312C	796	37	22
<i>Sabal palmetto</i>	581008A	263	42	6
<i>Sabal yapa</i>	59492A	235	41	6
<i>Sabal yapa</i>	57690F	259	43	6
<i>Sabal yapa</i>	57690G	204	43	5
<i>Sabal yapa</i>	60458C	325	40	8
<i>Satakentia liukuensis</i>	68317D	438	32	14
<i>Satakentia liukuensis</i>	68317E	470	32	15
<i>Satakentia liukuensis</i>	68317F	499	32	16
<i>Satakentia liukuensis</i>	68317J	374	32	12
<i>Satakentia liukuensis</i>	68317M	725	32	23
<i>Schippia concolor</i>	79553B	228	21	11
<i>Schippia concolor</i>	591200D	233	41	6
<i>Schippia concolor</i>	591200F	283	41	7
<i>Schippia concolor</i>	5759A	418	43	10
<i>Siphokentia beguinii</i>	59969C	461	41	11
<i>Syagrus amara</i>	80296E	358	20	18
<i>Syagrus amara</i>	80296L	621	20	31
<i>Syagrus sancona</i>	83132E	393	17	23
<i>Syagrus × costae</i>	62232C	470	38	12
<i>Syagrus × costae</i>	62232D	443	38	12
<i>Syagrus × costae</i>	59940D	271	41	7
<i>Thrinax excelsa</i>	83347B	232	17	14
<i>Thrinax morrisii</i>	58468K	116	42	3
<i>Thrinax radiata</i>	59460A	258	41	6
<i>Thrinax radiata</i>	67383B	282	33	9
<i>Veitchia vitiensis</i>	89204B	246	11	22
<i>Wodyetia bifurcata</i>	8234E	526	18	29