

Effects of the Winter of 1976-77 on Certain Palm Species in Dallas, Texas

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I am sure that no one east of the Rockies will soon forget the winter of 1976-77. Many long-standing records for low temperatures and prolonged cold were broken. About the only good thing we can say about it is that it gave us an excellent opportunity to observe how much cold and freezing temperatures certain palms can take.

Table 1 gives the date and temperature of every day when the temperature was 32° F or below in Dallas, Texas. Rainfall is also given for each month. The thermometer used is a Taylor Minimum-Maximum type and is accurate. During the 30 years from 1940 through 1969, Dallas has averaged 35 days per year in which the low temperature was 32° F or below. The winter of 1976-77 recorded 65 such days. The lowest temperature was 9° F. Another indication of the severity of the winter was that the temperature fell into the "teens" or below on 11 nights, with four consecutive nights of temperature between 12° F and 16° F.

Pictures taken in June 1977 show representative palms that survived the winter of 1976-77. Where leaves had been killed, they were trimmed away as new growth emerged. Notes on individual species follow. It is hoped that these data will shed additional light on cold hardiness of selected species.

Sabal minor is native, therefore no damage was expected, and this was true of adult plants and those younger ones that had gone through at least one previous winter. Some selected seed-

lings did perish whereas others survived. Those surviving mostly did not have a north exposure, although a few did survive in the coldest areas.

Sabal texana experienced some damage; the older the plant, the less the damage. One large plant, with 4½ feet of trunk, showed some leaflet tip burn, but most of the leaf surface remained green. One peculiar thing occurred, however: the exposed leaf surfaces had very narrow elongated areas that apparently died and fell out giving a minor buckshot appearance. These areas constituted less than 5% of the leaf surface. The bud area showed very minor browning, which subsequently grew out. All exposed leaves, including the central unexpanded one, of plants in the range of three to seven years of age were killed, but new leaves have grown out. As might be expected, plants with some protection, like a fence, were less burned. Numerous seedlings were present before winter but only a few survived. Natural selection may have been a factor here.

Sabal palmetto plants varied in age from two to six years. Generally speaking, individuals experienced less leaf burn than *Sabal texana* of comparable age. A few two-year-old plants perished, but the remainder have recovered. *Sabal palmetto* appears to be slower growing than *Sabal texana* in our climate, possibly due to lower humidity and dryer soil conditions.

Sabal etonia exhibits the same hardi-



1. Palms in Dallas, Texas, from left to right, are *Trachycarpus fortunei* (two individuals), *Washingtonia filifera* 11 years old, and *Sabal texana* 15 years old. Photographed in June 1977.



3. *Sabal texana* approximately 15 years old with inflorescences in June 1977.

ness as *Sabal minor*. There was no damage to the three six-year-old plants.

Sabal causiarrum is borderline in Dallas. Each winter it freezes to the ground but always comes out. The winter of 1976-77 was no exception. All four five-year-old plants grew out.

Trachycarpus fortunei experienced no burn on five of six plants ranging in size from 10 feet of trunk to 10 inches of trunk. Very slight tip burn to some leaflets occurred on the sixth plant. Some petioles were broken by the

weight of ice and snow, but these still retained green leaves. Some seedling plants experienced moderate leaf burn.

Trachycarpus wagneranus was represented by two rather weak plants at the beginning of the winter and both died.

Chamaerops humilis has not shown itself to be as hardy here as *Trachycarpus fortunei*. One plant with eight inches of trunk has had heart rot for several winters. Each previous spring



2. *Sabal minor* approximately 15 years from seed in bloom, June 1977. A trunk of *Trachycarpus fortunei* appears at right.



4. *Butia capitata* of unknown age in June 1977.

Table 1. Temperature and rainfall in Dallas, Texas, winter of 1976-77

Date	Low Temp (F)	Date	Low Temp (F)	Date	Low Temp (F)	Date	Low Temp (F)
11/5/76	27°	12/9	32°	1/7	27°	2/4	28°
11/8	28°	12/11	30°	**1/9	12°	2/5	30°
11/12	31°	12/12	30°	1/10	9°	2/6	24°
11/13	*28°	12/16	30°	1/11	20°	2/9	30°
11/14	29°	12/17	29°	1/15	21°	2/13	32°
11/15	32°	12/20	32°	1/16	16°	2/16	28°
11/18	29°	12/21	21°	1/17	12°	2/17	31°
11/22	24°	12/22	28°	1/18	15°	2/20	30°
11/28	21°	12/23	24°	1/19	16°	2/27	26°
11/29	13°	12/24	26°	1/20	22°	2/28	31°
11/30	21°	12/26	25°	1/21	25°	3/6	27°
12/1	26°	12/31	11°	1/25	24°	3/7	32°
12/2	25°	1/1/77	18°	1/28	30°	3/20	30°
12/3	28°	**1/2	26°	1/29	15°	3/22	30°
12/4	29°	1/3	28°	***1/30	29°		
12/7	22°	1/5	28°	1/31	10°		
12/8	25°	1/6	30°	2/1	20°		

* 4½" snow.

** Freezing rain and sleet.

*** 4" snow.

Rainfall in inches:

Oct. 1976—4.56

Nov. 1976—0.48

Dec. 1976—2.67

Jan. 1977—2.38

Feb. 1977—2.40

Mar. 1977—8.63

the main trunk grew out. In the spring of 1977, the main trunk recovered and the four suckers were green and growing well. All leaves, including the unexpanded one, were killed on two younger plants six years of age but only one recovered. The younger plants grown from seed in open ground here had done better in previous winters than the larger plant with eight inches of trunk, which was purchased several years ago in Houston.

Serenoa repens showed no damage and is in the same hardiness category here as *Sabal minor* and *S. etonia*. The three plants involved are five years old from seed collected by Dent Smith.

Jubaea chilensis is very hardy here, according to my observations. One plant, six years old, showed no damage. The other plant, four years old, showed no damage and started growing in the spring, but did succumb to a center bud rot. The younger plant had never been as vigorous as the older one.

Trithrinax campestris is another hardy species here. Several plants, ranging from three to four years of age, showed very slight tip burn in some but no damage in others.

Trithrinax acanthocoma, represented by only one plant, failed to survive the winter.

Rhapidothymum hystrix is a very

hardy species, but very slow growing. Two plants, four years old, showed no damage. One seedling plant a year old was weak in the fall and did not survive the winter. Two adult specimens in White Rock Lake Park showed no damage.

Butia capitata suffered moderate leaf burn, even in the bud area. This plant has two feet of trunk and grew out well.

Butia sp. was represented by two plants, one a year old, the other two years old. Only the latter survived.

Butia paraguayensis was represented by eight plants two years old and two plants one year old. Two of the two-year-old plants were badly burned but grew out. The others died.

Nannorrhops ritchiana, of which I had two plants five years old, two four years old, and one three years old, survived with moderate to severe burn and grew out.

Acoelorrhapha wrightii with four inches of trunk started to grow out and two new suckers appeared at the base of the trunk in the spring of 1977.

Erythea armata went into the winter with two plants. One with two inches of trunk suffered severe burn but grew out well. The other plant, six years old, died.

Erythea edulis, with two plants three years old, had all parts above ground killed but grew out well.

Livistona chinensis has previously lost all parts above ground each winter but foliage grew back. One of two plants died in the winter of 1976-77, the other grew out.

Livistona australis also loses all its foliage each winter. I have one plant, two years of age, that burned similarly this winter. It is now growing out.

Washingtonia filifera suffered the worst winter burn I have seen on this species. Two trees, with trunks of 10½ feet and 8½ feet, had leaves burned in-

cluding the unexpanded blades. Both grew out. One other plant, four years of age, suffered similar damage and also grew out. Numerous seedlings perished. All leaves of the many specimens in Fair Park were also killed but new ones grew out nicely.

Phoenix dactylifera has suffered severe damage with loss of all leaves in the crown each winter. I had two plants six years old and another with one foot of trunk. Only the last grew out.

Phoenix canariensis was also represented by two plants, one six years old and the other with eight inches of trunk bought last spring. Both died.

Rhapis humilis in the form of four three-year-old plants was located in protected areas. Only one survived, and it is weak.

Various species in containers above ground. I plant most palm seeds in open ground. However, I had various species, some normally very hardy, in pots as an experiment to see how they would survive the winter. All perished. I am convinced that the latent warmth of the soil is responsible for seedling survival, since the root zone is not subject to freezing in our climate.

Postscript

When edited manuscript was sent for checking, we had just finished a second winter almost as bad as the 1976-77 one. I write "almost" because I find less browning of leaves on most of the palms. This winter we had much more snow and ice. In fact, we set a record of about 18 inches over a period of six different snows. As of 25 March 1978, we have had 63 days at or below 32° F. We also had 11 days with the low in the "teens" and our minimum this winter was 10° F.

I know that absolute minimum temperatures are not the whole story on palm survival. Cold, desiccating wind

is a big factor, and in 1976-77 we had this. In the winter of 1977-78 there was little wind but excessive cloudiness, which kept our temperatures down. The winter of 1977-78 was concentrated in January and February. In fact, until 9 January 1978 we were experiencing a very "normal" winter. From then until 22 February it was solid winter and the average temperature was actually lower than that of 1976-77.

The big question is why the palms show less damage in 1977-78 than in 1976-77. Perhaps my explanation of the effects on *Washingtonia filifera* best explain the difference between the two winters.

In 1976-77, leaves on all plants were completely burned. In fact, the center

bud leaf just above the point where it emerges from the trunk (on the two larger plants) was so badly damaged that when it finally grew out, the first leaves on each did not completely unfold but grew out at an angle of about 30° from perpendicular. The small plant four years old showed no green in the bud area but later grew out.

In 1977-78, the two larger trees still were green in the bud area and the fans are now unfolding normally. In fact, some of the outer leaves still showed considerable green areas up to 17-19 February, when we got eight inches of snow and a low of 11° F on the 18th and 10° F on the 19th. The smaller plant, now five years old, already has a green fan growing out.

Notice

The Palm Beach Chapter will hold a plant sale on Saturday, October 7, 1978, beginning at 10 a. m. at the Mounts Agricultural Center, 531 N. Military Trail, West Palm Beach.

CULINARY NOTES

The following recipe may be of interest to Palm Society members who have fruiting plants of *Arenga pinnata* available to them. It comes from Mrs. Ligaya Capin, a student at the College of Home Economics, Central Mindanao University, Musuan, Bukidnon 8213, Philippine Islands, via Mr. Kermit H. Adams and Professor Norma R. Montemayor, who has given permission to publish it.

KA-ONG PRESERVES

Ingredients: 1 cup of sugar and ½ cup of water per cup (about 23 pieces) of young *ka-ong* nuts (*Arenga pinnata*).

Put *ka-ong* nuts in a large kettle with enough water to cover the nuts, boil for 20 minutes, then rinse with cold water. Repeat this procedure three times, then pound the nuts individually to get out the edible portion (the white gummy part inside the shell). Soak this edible portion in rice washing overnight and rinse thoroughly with tap water. If rice washing is not available, substitute a mixture of 1 tablespoon vinegar (4.5% acidity) to a cup of water or a mixture of 1 tablespoon flour to a cup of water.

Make a syrup of ½ cup sugar and ½ cup water per cup of *ka-ong* nuts, bring to a boil, add the *ka-ong*, and boil for approximately ten minutes—the *ka-ong* should not become mushy. Then soak the *ka-ong* in the syrup overnight.

After soaking, drain the syrup from the *ka-ong*, add the second ½ cup of sugar per cup of *ka-ong* to the syrup, bringing this to a boil, then return the *ka-ong* and simmer until the syrup is thick.

Pack in sterilized jars immediately, seeing to it that the *ka-ong* is completely covered with syrup, and seal at once.