

Cold Injury to Palms

Every few winters, arctic fronts plunge frigid temperatures into our state, harming landscape plants. Some of the plants most afflicted by the ravages of winter are palms that have been planted outside or near the edge of their cold adaptability. Let's think about a little first aid for these plants that add enjoyment to our landscapes.

Selecting the Palm and Its Location

The amount of cold injury to a palm depends upon the type (or species), how well it has adapted to its landscape, the duration of the cold temperatures, and the location of plants or buildings around the palm that may offer some protection. When selecting a palm for your landscape, choose a species that is well adapted to our Mississippi climate, not to central Florida's climate. Also, try to buy locally. Trees raised here will more likely be adapted to our conditions than the trees transported from farther south. Refer to Tables 1 and 2 and Mississippi State University Extension Publication 2948,

"Palms and Cycads for the Midsouth Landscape" available online at extension.msstate.edu for more details and tips.

If you must pick a cold-sensitive species, blocking our common winter winds is beneficial. Its chance of survival can be slightly improved if you plant the palm where it can be sheltered by buildings and other plants. This idea is discussed in more depth in MSU Extension Publication 2948. Two kinds of cold injury are common in Mississippi. Frost (or radiational freeze) and hard freeze damage.

Frost damage occurs during a night when no cloud cover is present and the wind is calm. The leaf surface radiates its heat into the clear night air and the leaf temperature may fall below the air temperature. Frost may result. This event then depends on direct exposure to the night sky and by the absence of wind in the leaf area. This combination means damage can be spotty. Figure 1 shows a sabal or cabbage palm (*Sabal palmetto*) growing in Natchez, MS which suffered from frost about five nights prior to the image being taken.



Figure 1. A sabal or cabbage palm (*Sabal palmetto*) growing in Natchez, MS suffered from frost five nights prior to the image being taken. The white leaf tips are typical of recent frost injury. They will brown, and become brittle with time. Note how they are more prominent in leaf tips more directly exposed to the sky.

Table 1. Common palms for the Mississippi Gulf Coast.

| Common Name | Scientific Name | Hardy to USDA Zone | Sympodial or Monopodial |
|-------------------------------------------|-------------------------------|--------------------|-------------------------|
| Dwarf palmetto | <i>Sabal minor</i> | 6 | sympodial |
| Needle palm | <i>Rhapidophyllum hystrix</i> | 6 | sympodial |
| Windmill palm | <i>Trachycarpus fortunei</i> | 7 | monopodial |
| European fan palm/ Mediterranean fan palm | <i>Chamaerops humilis</i> | 7b | sympodial |
| Pindo palm, jelly palm | <i>Butia capitata</i> | 8a | monopodial |
| Sabal palm, palmetto palm, cabbage palm | <i>Sabal palmetto</i> | 8a | monopodial |
| Saw palmetto | <i>Serenoa repens</i> | 8a | monopodial |
| California fan palm, Washington palm | <i>Washingtonia filifera</i> | 8a | monopodial |
| Date palm | <i>Phoenix dactylifera</i> | 8b | monopodial |
| Sliver date palm, Indian date palm | <i>Phoenix sylvestris</i> | 8b | monopodial |
| Canary Island date palm | <i>Phoenix canariensis</i> | 9a | monopodial |
| Mexican fan palm, Washington palm | <i>Washingtonia robusta</i> | 9a | monopodial |

Table 2. Palm-like plants.

| Common Name | Scientific Name | Hardy to USDA Zone | Sympodial or Monopodial |
|----------------|-----------------------|--------------------|-------------------------|
| Sago palm | <i>Cycas revoluta</i> | 8b | sympodial |
| Chestnut dioon | <i>Dioon edule</i> | 8b | sympodial |
| Coontie | <i>Zamia pumila</i> | 8b | sympodial when older |

A hard freeze is when air and leaf temperatures drop below 32°F (0°C), but more so at 28°F (-2.2°C). In this case, wind will more quickly reduce leaf temperatures and plant damage will probably be more even. However, some parts of a palm, such as the lower and older leaves, are more susceptible to freeze damage than newer, upper leaves (Figure 2).



Figure 2. A fan palm (*Chamaerops humilis*) distinctly shows the freeze hardiness of the upper and lower leaves.

Figure 3 shows the effects of a hard freeze on a fan palm where all exposed leaves were killed except for the recently unfolded spear leaf at the top. Leaving these leaves on the palm to protect the palm heart until more leaves are produced will help protect the plant from further damage.

Palm Care to Minimize Cold Damage

You can prepare your palms for a cold event by covering the top of the palm with a blanket or canvas. Be careful to not break the fronds while placing and removing it. Avoid plastic, since cold is directly transmitted through it to the plant below.

You can also help your palm survive cold periods ahead of time through proper care and maintenance. Research on



Figure 3. The effects of a hard freeze on a fan palm.

coconut palms in Florida has shown that proper fertilization promotes resistance to cold injury. Using typical turfgrass fertilizers in the landscape around palms results in lush growth, but depletes vital nutrients (potassium and magnesium) in the palm, thus creating deficiency symptoms and weaker plants. They have found that applications of a slow-release fertilizer formulated for palms and mixed in the ratio of 8-2-12-4 (nitrogen-phosphorus-potassium-magnesium) plus micronutrients benefits both palms and St. Augustinegrass. The same fertilizers and deficiencies may not apply to the palm-like species, such as the sago palm (and others listed in Table 2).

Louisiana experts recommend a single fertilization per year in May. Fertilizing later may result in too much nitrogen too late in the year. Too much nitrogen may have three impacts:

1. Extra nitrogen makes the plant absorb extra water, so it will be more susceptible to cold damage.
2. Extra nitrogen will facilitate the growth of secondary infections.
3. Extra nitrogen may throw off the nutrient balance of the palm, resulting in deficiencies in potassium and the micronutrients boron and magnesium.

Mulching around your palm may help keep lawn fertilizers from being deposited around the palm, avoiding these problems. However, a fertility program would be beneficial to most Gulf Coast palms.

Proper watering is an important factor in plant growth. There are two popular, but potentially damaging practices for watering palms: Watering the palm's growing point and watering the crown instead of the roots. Palms have been seriously injured by fungi and secondary decay organisms associated with overwatering the growing tip. Studies in Florida have shown no advantage to watering the base of the tree where it enters the ground (the crown) rather than the roots. Watering the root area is as effective as watering the crown, and it may encourage better root growth. Irrigation is probably not needed if rainfall is adequate.

Unique Palm Growth

To understand cold injury in palms and how best to protect these treasures in our landscape, we must understand how they grow and function differently from softwoods and hardwoods. Unlike hardwood trees, palms have one central growing point, the point from which the fronds (leaves) grow. This part is called the palm heart or palm bud. Located at the top of the trunk, the palm heart is in an exposed location. The primary protectors of the palm heart are the fronds, which shield it from blowing objects, hot sun, wind, and cold.

Also, unlike softwood and hardwood trees which can heal and wall-off wounds, palm wounds do not heal. Wounds caused by things such as nails, climbing spikes, or wind-blown debris will not heal and create areas for pathogens to enter and cause disease. Wounded plants are often infected once weakened, and infected palms often die.

Care of the Fronds

After a frost or cold injury, you may notice that the lower, older fronds are more damaged than the younger, upper fronds. Regardless of how they appear, it is important to keep the fronds on as long as possible. The fronds shelter the palm heart from direct sun, wind, and mechanical injury, so retaining old fronds until new fronds have grown is beneficial (Figure 4).

Palms grow slowly and commonly require seven months to begin to re-leaf after cold injury. When they do produce new fronds, the first several are likely to be deformed or discolored. When removing dead fronds from the palm, after two or three new leaves have formed, remember not to pull them off and potentially wound the trunk. Cut them—a sharp



Figure 4. While sago palms are not true palms, they are part of our palm-like landscape. Figure 4a (left) a sago palm damaged by upper 20°F temperatures. Note the uneven frond damage. Figure 4b (right) sago palm recovering from temperatures near 20°F. Note the dead fronds on the main stem. Peeking from the gravel below, is a stem only several years old that has leaves immediately above and touching the gravel. Such basal stem sprouts often form as a result of low, but not killing temperatures (sympodial recovery). The white spots on the frond are a scale insect, cycad aulacaspis scale. For management tips about scale insects in general, refer to MSU Extension Publication 2369, “Insect Pests of Ornamental Plants in the Home Landscape” available online at extension.msstate.edu.

linoleum knife seems to work about as well as anything. For frond removal, wait until there is no longer any green left, and all chances of further cold is gone. Even though much of the palm is brown, there may still be needed micronutrients in the frond the palm can use.

If you can pull the spear leaf (the newly emerging frond that is still tightly rolled and sticks up straight) from the top of the palm weeks after the cold event, then cold has injured it. The dead plant material and wounds caused by the cold may leave the plant open to fungal and bacterial secondary decay organisms which can soften the palm and may produce an offensive smell. The base of the spear leaf is especially sensitive to cold injury and secondary infection.

Since copper-based fungicides are the only ones that can fend off both bacteria and fungi, the University of Florida indicates that a treatment with a pH neutralized copper fungicide drench to the palm heart area may help, although it has not been confirmed by controlled tests.

The purpose is to inhibit the secondary bacterial and fungal decay organisms associated with the cold injury, not to manage a specific disease. A link to the University of Florida palm work, including their "Cold Damage on Palms" publication, is at the end of this publication

Follow label directions, and do not apply more than twice. Copper fungicides with some types of palms labeled for disease control include Bonide Copper Fungicide Concentrate, Camelot O, Cuprofix Ultra 40 Disperss, Monterey LiquiCop Copper Garden Spray. Other products may also be labeled, and labels change, so be sure to review the label carefully before buying a copper fungicide. Do not use a water-soluble copper formulation unless the pH of the solution has been neutralized according to label instructions.

If the top of the palm falls over, fluid oozes out the side of the trunk, or you see reddish soft areas in the trunk, the tree is dead and needs to be removed. If your species of palm has a sympodial growth pattern, it is possible that it will sprout a new side bud near the ground and produce a new tree (see Tables 1 and 2). Cut sympodial palms several feet above the ground. A dead monopodial palm should be cut near the ground.

For More Information

- [University of Florida – Fort Lauderdale Research and Education Center](#)
 - [Palm production and maintenance](#)
 - [Extension plant pathology publications](#)
 - ["Cold Damage on Palms" publication](#)
- The Southeastern Palm Society

Notes

Notes

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