

## WODYETIA BIFURCATA, A NEWLY DESCRIBED PALM FROM AUSTRALIA

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**Abstract.** *Wodyetia bifurcata*, the foxtail palm, a newly described palm from Australia has proven to be adapted to south Florida soils and to occasional cold weather. The foxtail palm, as it is commonly called, grows rapidly from seed and has tolerated temperatures of 29°F (-1.7°C) in a west Broward nursery. The plumose leaves are attractively arranged and resemble a foxtail.

On August 17, 1975, Mr. B. Hyland, while pig hunting in the remote Bathurst Bay area of Northern Australia, discovered several unusual palm seeds on the ground and washed up on a beach. On February 7, 1982, the author received six seeds of this palm from a Northern Australia Palm Society member, Maria Walford-Higgins, who described it as a new genus from an isolated population in dry, granite boulder country in the Melville Range inland from Bathurst Bay, Cape York Peninsula, North Queensland, Australia. The seeds were round, about 32 mm long, 22 mm wide and covered with unusual wavy, slightly depressed fibrous lines, strikingly different from other Australian palms.

In 1983, Dr. A. Irvine, Division of Forest Research, Atherton, Australia, described the new palm as a new arecoid genus from Australia, *Wodyetia bifurcata*, publishing it in *Principes*, the Palm Society Journal.

All six of the author's seeds germinated, and grew rapidly. One seedling, planted in full sun in 1984, in the author's coral rock Miami garden, attained a height of twelve feet in four years. Because of the handsome plumose leaves, Palm Society members have since called the new palm the foxtail palm.

Palm Society member and Broward County nurseryman, Bob Davis, obtained seeds of *Wodyetia* on a 1984 Palm Society biennial post-convention trip to Australia. Sub-

sequent seedlings in his nursery survived the freeze of the winter of 1984-1985 when the temperatures were below freezing for several hours. California Palm Society member, Pauleen Sullivan, reported a young plant surviving 29°F in her Ventura, California, garden during the 1987 southern California freeze.

The native habitat of the foxtail palm is rocky hillsides where the palm grows in full sun among granite boulders in open forests, well drained with permanent water near. Climatic conditions have a strong seasonally dry component with drought stress likely for six months with sporadic seed germination continuing for at least 14 months. Mature plants range in height from 18-45 feet.

Brisbane, Australian Palm Society member and nurseryman, Stan Walkley, recently reported that seed prices range from 40¢ each to \$5.00 each in Australia and that an attempt is being made to establish a plantation for future seed harvest since the entire range of the species is within the Melville National Park in Northern Queensland and, therefore, protected. The author believes the foxtail palm with its strikingly handsome plumose leaves will become one of the most desirable dooryard palms for South Florida as seed becomes more available. At present, three South Florida nurserymen are growing the foxtail palms, Colleen Boggs, Pine Island Nursery, Miami, Florida, Jack Miller, Botanicals Nursery, Homestead, Florida, and Palm Society member, Carol Graff, Miami, Florida. *Wodyetia* is in the *Ptychosperma* alliance of the arecoid crownshafted palms and thus related to *P. elegans* and *Carpentaria acuminata*, two well known South Florida landscape palms that also originate in Australia.

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## THE DECLINE OF THE SOUTH FLORIDA SLASH PINE

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**Abstract:** South Florida continues to experience a boom in population growth. Unfortunately, as the population in South Florida continues to increase, many of our native plants are experiencing a decrease. Never is this more apparent than with the South Florida Slash Pine (*Pinus elliottii* var. *densa*). Reasons for the decline and death of these trees are numbered. This Paper will take a closer look at these reasons.

Forests are one of Florida's most prized natural resources. Almost half of the state's 35 million acres is forested. Forested land can be grouped into three categories:

- 1) Timberland
- 2) Woodland
- 3) Reserved timberland.

Timberland refers to land at least 16.7 percent stocked by forest trees of any size or capable of producing 20 cubic feet of industrial wood per acre per year. Woodland refers to forest land incapable of producing 20 cubic feet per acre per year of industrial wood under natural conditions,

because of adverse site conditions. Reserved timberland, is land capable of qualifying as timberland but has been withdrawn through statutes or administrative designation.

Of South Florida's nearly eight million acres, only about one-fourth is forested. Since 1980 in South Florida, the area of timberland has decreased by 175,000 acres, or by 21%. The general trend is that while timberland has decreased, woodland has increased as has non-forested land. Non-forested land is defined as land which has never supported forests and land formerly forested where timber production is prevented by development for other uses. Reclassification of timberland to woodland and reserved timberland accounted for much of the decrease. An increase in non-forested lands as a result of agriculture and urban development accounted for the rest.

To put southern South Florida's forested land in perspective, of the ten total counties (Broward, Charlotte, Collier, Dade, Glades, Hendry, Lee, Martin, Monroe, and Palm Beach) included, Palm Beach, Broward and Dade make up nearly 50% of the total land mass, yet no timberland is present and only 30% of woodland is present. These three counties account for over 50% of the non-forest land in South Florida. Woodland is scarce and it is important we care for it. Due to urban development, one of South Florida's most treasured native trees, the South Florida Slash Pine is experiencing a decline at an alarming rate.

To escape the rigors of urban life, more and more people are moving to the limited forested lands that we now have. The pine used to be a major supplier to South Florida's timber industry. As development has increased and the timber industry in South Florida has decreased, its importance as a wood producer in South Florida has greatly diminished. As a result, what was once found in discrete ecological communities and primarily used as a timber tree, has taken on an added responsibility as an important part of the Florida landscape.

### The Problems

The South Florida Slash Pine is a native pine that can reach heights of over 100 feet. It has needles in 2's and 3's that are 7 to 12 inches long. It prefers well drained acidic soils. It prefers a soil pH of 4-6. It also prefers that its roots not be disturbed.

As the population increases (over 4 million in Dade, Broward and Palm Beach County alone, the trend is for people to move to forested areas that were once considered unliveable. As a consequence of the trend, people are incorporating the existing pines into their landscapes.

By changing the environment surrounding the pine from a rural setting to an urban setting, we subject the tree to many different, conditions that it normally would not encounter, including stresses that cause the decline and death of these native pines. The following is a list of problems encountered in the urban setting that may lead to their decline.

*pH changes.* As stated before, the South Florida Slash Pine prefers a soil pH of 4-6, which is on the acidic side. A change in the pH to a more basic level is the chief reason for decline. As a direct result from watering and fertilizing surrounding planted vegetation the pH is driven up to the 7-9 range of the scale.

Once the pH has risen to this range, it makes it impos-

sible for the pines to utilize iron and other minor elements that it needs to thrive. In South Florida we encounter this problem often because the same things that keep grass looking healthy and green (fertilizer and water) are harmful to the native slash pine. To complicate the matter, our soils that are often used around development are not soils that are native to the area and many times these fill soils are alkaline in nature. Also our water sources often have a pH of 7.2-7.4 which drives the pH up in the soil.

So what do we do? Basically there are several things that can be done to remedy the situation. The first thought is to limit plantings around the pines when landscaping. This goes for turf areas too. When possible leave the areas around the base of the tree in their natural state. Leave the needles that fall from the tree in place. They help keep the acidity down. If you must plant turf, plant some type of turf that requires less maintenance than St. Augustine, such as Bahia.

You may have to make a value judgment. Do you want a lush green lawn or healthy pine trees in the yard? If you favor the pines, several remedies are recommended.

- 1) Lower the pH of the soil to at least 6.0 with an application of 4 pounds of sulfur per 100 square feet of area under the trees.

- 2) Apply iron as chelate at 1 pound per tree.

- 3) Ammonium Sulphate should be used for lawn maintenance.

*Maintenance Damage.* Keep weed eaters, edgers and machetes away from the pines. No tool in the history of lawn maintenance has led to the decline of trees as has the weed eater. Weed eaters, when used improperly, effectively girdle the tree. Use chemical or manual means as an alternative to clean grass from around the base of trees. Better yet, don't plant turf around the base of trees to begin with.

Use proper pruning techniques. Follow the National Arborists Association standards. These guidelines are widely accepted in the field.

*Construction Damage.* More trees are lost to construction damage than any other factor. Pine tree roots are very susceptible to damage as a result of compaction, severing and/or grade changes. Protect your trees during construction. Keep heavy equipment away from the trees. This keeps compaction and mechanical damage to a minimum. When applicable, build barricades around trees that you desire to save during construction. Build drywells around trees when altering the grade becomes necessary. Refer to the *Florida Division of Forestry Tree Protection Manual for Builders and Developers* available from your county Forester.

*Fire and Drought.* Both fire and drought may cause undue stress on pine trees. While pine trees may appear to survive fires or long term droughts, they may indeed be under heavy stress that will inhibit its growth.

### The Killers

These factors acting singly or in any combination may put stress on a tree. Stress on a tree is gradual and often the first symptoms include chlorotic or yellowing needles that may not occur for two or four years. Often people in the field will refer to the decline of South Florida Slash Pine as the "Golden Pine Syndrome."

Once a tree becomes stressed and/or weakened, it is an open invitation for various diseases and insects to attack it

and eventually cause its death. Generally stress alone will not kill a tree. It is a combination of stress and insects or diseases that will kill a tree.

One of the major pine tree killers are the pine bark beetles. They can kill a pine tree in a matter of days. There are several types of beetles that occur in the south which include: the Southern Pine Beetle, the Black Turpentine Beetle and the Ips Beetle. It has been estimated that from 1973 to 1977, bark beetles collectively killed enough timber to build about 300,000 average sized homes.

The Ips Beetles are the ones that do the most damage in South Florida. Unlike the Southern Pine Beetle, which often kill large groups of pines, the Ips Beetles usually search out and attack scattered weakened or stressed trees. The Ips Beetles are about 3-5 mm in length and black in color.

Female beetles will bore into the bark of a tree and construct egg galleries and lay eggs. Once the eggs hatch, the larvae tunnel in the same galleries. The tunneling of the larvae and adults severs the trees nutrient and water transport systems. After the larvae pupates, the adult emerges to seek out another susceptible tree.

Heaviest activity is during the summer and spring months. Eight to ten generations per year are possible.

Symptoms of damage are threefold:

1) Foliage discolorization: needles turn from green to yellow to red to brown.

2) Small lumps of reddish-orange pitch on tree stems or branches.

3) Reddish-orange boring dust around base at tree or in bark crevices.

Once a tree becomes infested with ips beetles, there is not much you can do for that tree. The key is to keep trees healthy to begin with so the beetles will not be attracted to them. A healthy tree can generally ward off attacks by forcing the adult beetles out the pitch tubes via the sap flow. Control methods include maintaining tree vigor and health, avoiding mechanical injury to the trees, removing infested trees, and spraying nearby infested or high risk trees with an approved insecticide during periods of ips activity.

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## PLANTING DEPTH AND TREE SURVIVAL

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**Abstract.** When transplanting trees it is almost always best to set them at the same height as that at which they were growing. Some plants are more sensitive than others to being planted too deep; the factors affecting plant response are

There are other insects that can damage the South Florida Slash Pine. They include pine tip moths, pine scales and pine sawflies. For the most part, they may cause the trees foliage to become unsightly, yet they can be controlled and damage be kept at a minimum. None of the aforementioned cause complete tree devastation like pine beetle.

Several diseases that affect South Florida Slash Pine should also be mentioned. They include needle cast, pitch canker and fusiform rust. These will not be discussed at length now, for the simple reason they are not that common. This is not to say that they are not present in the field, but there occurrence is scattered.

### Summary

As the population grows in South Florida, more and more people are moving to the limited forest land that we now have. As we move into these forested lands, we are incorporating the South Florida Slash Pine into our landscapes. We are essentially taking the pine out of its natural environment and surrounding it with a more harsh urban environment. We continually ask ourselves, "Why are the pines declining?" In reality it is no wonder. We must continue to take extra precautions to avoid problems with pines in the future. Only then can man and the South Florida Slash Pine co-exist.

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**discussed, and a list of species that are subject to damage is given.**

The root system of trees is not well understood. In fact it is even more of a mystery to most people than the above ground parts, which, to judge from the usual standard of pruning and tree care in Florida, are themselves a closed and frightening area of study. Research on roots is difficult and time consuming, but workers such as Dr. Thomas Perry of North Carolina State University and Dr. Ed Gilman of the University of Florida are gradually putting together a picture of root activities that will help horticulturists make valid recommendations on all aspects of encouraging a healthy root system.

In most dicotyledonous trees the mature root system includes at least the remnants of a taproot that grows

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